OCTOBER, 1906 Price 20 Cents

AMERICAN CARPENTER AND BUILDER

The World's Greatest Building Paper

DUTCH ARCHITECTURE IN SOUTH AFRICA. SEE PAGE 773.

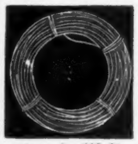
SPECIAL CARPENTERS' NUMBER.

Merchandise from Sheriffs' and Receivers' Sales

SAVE 30 TO 50 PER CENT ON YOUR PURCHASES

THE CHICAGO HOUSE WRECKING COMPANY is the largest concern in the world devoted to the purchase and sale of general stocks of merchandise of every kind from Sheriffs', Receivers' and other sales. Our aim is to save you money. The wonderful opportunity that is now offered you to secure staple articles in every line at extremely low prices deserves your closest attention. The way to make money is to save it. Our whole business is one of quick action. We have these goods today and tomorrow they may be sold. Don't delay. Bargains wait for no man.

100 lb. Fence Wire $1.25



At this price No. 14 gauge painted Wire shorts. Other guages proportionate prices. Heavy galvanized wire shorts, put up in 100 lbs. to the coil, good for fencing and other purposes, new 14 guage, per 100 lbs. **$1.40.** Galvanized Barb Wire, 2 and 4 point, per 100 lbs. **$2.50.** B. B. Phone wire, galvanized, per 100 lbs. **$2.40.** Annealed wire, No. 17 guage, **$1.90.** Wire of all kinds and for every purpose.

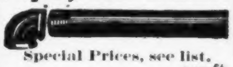
Gasoline Engines $55.

This price for our high grade National Engine. Best manufactured Simple. Other gasoline engines from $25 to $250. **Small Steam Outfits**, engines and boilers combined and seperate, from 2 H. P. to 10 H. P. **Locomotive Outfits**, on skids up to 35 H. P. **Saw Mill Outfits** etc. Machinery of all kinds.

Tapestry Brussels Carpets, 50c a yard

Neat designs, all colors. Velvet Carpet per yd. 72½c; Heavy Ingram Carpet 22c; reversible Bath Rugs 96c; Linoleum, per sq. yd. 31c; Oil Cloth 16c. Free Samples.

Pipe, all kinds

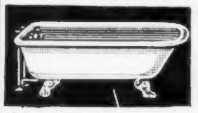


Special Prices, see list.

	per ft.
1 in. with couplings, - -	3½c
1¼ " " " - -	4½c
3½ " casing with couplings	10c
4 " " " "	14c

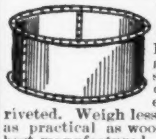
1,000,000 feet of piping for water gas, oil, etc. Rethreaded and in excellent condition. **Boiler Tubes** at low figures from the World's Fair.

Steel Enameled Bath Tubs, $6.00



At this price our 4½ foot hard wood rim, enameled steel tub, with nickel plated waste and overflow. Other lengths at proportionate prices. Handsome porcelain bath tub with full 3-inch roll rim, white enameled on the inside, seamless, cast iron, with all fine nickel-plated fittings at **$14.00.** Other tubs ranging in price to **$25.00.**

Galvanized Steel Tanks, $2.00.



Brand new galvanized strong and durable, extra well riveted. Weigh less and twice as practical as wooden tanks; best manufactured.

32-gallon tank - -	$2.00
73-gallon tank - - -	2.75
47-gallon tank - -	2.50
6-barrel tank - - -	5.50
Larger sizes in proportion.	
Feed Cookers - -	$9.20
Galvanized Troughs - -	.60
Steel Wagon Tanks - -	7.00
Tank Heaters - - -	2.50

The World's Bargain Center

That's what we are known as everywhere and there is reason for it. Our prices as a rule do not represent the oringinal manufacturer's cost. Our goods are the best. We do not sell anything but what is in first class condition. Satisfied customers all over the land will confirm this. We guarantee absolute satisfaction

We Bought Every Exposition

Including the great $50,000,000.00 St. Louis World's Fair, the World's Fair of Chicago, the Pan-American Exposition, the Trans-Mississippi Exposition. This has added enormously to our large stock. We have for sale all kinds of building material including lumber, sash, doors, windows, and in fact, everything needed in the construction of a building for any purpose.

Steel Roofing Per 100 Sq. Feet $1.50

Most economical and durable roof covering known. Easy to put on; requires no tools but a hatchet or a hammer. With ordinary care, will last many years. Thousands of satisfied customers everywhere have proven its virtues. Suitable for covering buildings of any kind. Also used for ceiling and siding. Fire-proof and water-proof. Cheaper and more lasting than shingles. Will not taint rain-water. Makes your building cooler in summer and warmer in winter. Absolutely perfect, brand new, painted two sides.

$1.50 is our price for our No. 15 grade of Flat Semi-Hardened steel roofing and siding each sheet 24 ins. wide and 24 ins. long. Our price on the corrugated like illustration; sheets 22 ins. wide and 24 ins. long, $1.60. At 25 cents per square additional we will furnish sheets 6 and 8 feet long.

Steel Pressed Brick Siding, per square, **$2.00**
Fine Steel Beaded Ceiling, per square, **2.00**

Air Tight Heaters Each 75c

Larger sizes at $1.00 and $2.00. 50 Hot Blast stoves, like illustration; will burn hard or soft coal or wood. Were used at the World's Fair, overhauled and first-class. Prices from $7 to $100

Cannon Heaters - - -	$4.80
Kitchen Ranges - - -	5.00
Steel Ranges - - - -	10.00

All kinds of stoves and heaters

Iron Beds, $1.40

Full size, strongly built, finely en'led $1.40. 100 single iron beds, complete with woven wire spring $2.25. Handsome brass trimmed beds, like picture, twice as heavy as ordinary bed of this style. Head 65-in. high; brass tubing ⅝ in. diam. handsomely finished in bronze; good enough for anyone. Retail for $35.00. Our price - - - - $17.50
200 Wooden beds, nicely carved good as new, each - $1.50
Full size cotton top mattresses from - - - $1.00 up.
Felt mattresses - - - $2.25
Beds and bedding of all kinds

Chairs, 50 cts.

This is our price for strong substantial, bow-back, hollow seat chairs. 1000 box seat, like cut, per set $9.00. 700 handsome library chairs saddle seats and cane seat Prices from 35c to $2.50. Hardwood folding chairs $2.50 Per doz. $6.00. A Complete stock of everything in the chair line.

Felt Roofing, 60 cts per sq.

2-ply **Eagle** brand 108 sq. ft., **60c.** 3-ply **Eagle** brand 108 sq. ft., **90c.** **Vulcanite Roofing** with nails, caps, cement, easy to put on; requires no coating; 108 square feet **$1.75** **Galvanized Rubber Roofing**, guaranteed for 20 to 30 yrs. No coating required. Price per 107 sq. ft, including nails, caps and cement for laps, 1-ply **$1.50**, 2-ply **$1.90**, 3-ply **$2.15** Samples furnished FREE.

Nursery Chairs 60c.

500 like cut, made of selected willow strong and substantial; removable seat, with wooden table. Will last for years.

Plain Children Chairs, bow back at 25c. **Handsome Child's Rockers,** golden Oak, with cane seat, worth $2.00, **Our price 95c.** Full sized, roomy reed rockers, worth $3.50. Our price **$1.75.** Reed furniture of all kinds.

Fancy Sewing Rockers, $1.25

600 like illustration, golden oak finish, full polish continuous post, strongly braced arm, 39-inch high screwed together. Built for wear. Worth $2.50. Our price - **$1.25**
1000 other rockers, **75c to $10** Handsome genuine leather rockers at $12.00. 50 beautiful davenports from the Pennsylvania building and other State Buildings at the World's Fair, overhauled and as good as new. Worth $75.00. Our price **$15 up.**

OUR GUARANTEE

We guarantee absolutely that all purchases of every kind made from us will prove entirely satisfactory and that the material will be exactly as represented. Thus you know you will receive what you buy and pay for. If the goods you receive from us are not as represented return them and your money will be immediately refunded.

OUR REFERENCES

Our Capital Stock and Surplus is over $1,000,000.00. We cheerfully invite investigation as to our responsibility. Look us up in Dun's or Bradstreet's or any other responsible mercantile agency. Ask any Express Company; write to the Editor of this or any other paper: ask any Banker, or refer direct to our depository—The Drovers' Deposit National Bank, Chicago.

WE PAY THE FREIGHT

To all points East of Colorado except Oklahoma, Texas and Indian Territory. Quotations to other points on application. This freight prepaid proposition **only refers to the Steel Roofing offer** in this advertisement. Satisfaction guaranteed or money refunded. We will send this roofing to any one answering this advertisement C. O. D., with privilege of examination if you will send us 25 per cent of the amount you order in cash; balance to be paid after material reaches your station. If not found as represented, you do not have to take the shipment and we will cheerfully refund your deposit. All kinds of roofing supplies, galvanized conductor pipe eave trough, steel snips, fittings, etc.

The House That Saves You Money

That's the name we are known by those who are in the habit of patronizing us. You are bound to save big money on your purchases of any kind, from us. There isn't any article that we handle but what we can sell you at a lower price than you can purchase it for elsewhere. You will appreciate this more and more as you get to know us better. No Sheriffs' or Receivers' sale is complete without the presence of our alert representatives. We get all the good things in sight. Because we offer goods at lower prices than manufacturers cost has earned for us the good will of thousands of families

Our New 500 Page Catalog No. 742 FREE

This book is one that every shrewd buyer must send for. It is full of bargains from cover to cover, and quotes the very lowest prices on everything needed on the farm and in the home. You will save money by referring to it often. The list above shows only a few articles out of the thousands described, but the prices give you an idea of what you save by sending your orders to us. **Cut out this ad. Make a cross mark on those items that most interest you,** and we will send you much valuable information. Also fill in the coupon to your right. Our new catalog will be sent you absolutely free and prepaid. Or send us your name and address, where you have seen this ad. and what items interest you.

CHICAGO HOUSE WRECKING COMPANY, 35th and Iron Sts. CHICAGO, ILL.

CHICAGO HOUSE WRECKING CO.
35th and Iron Sts., Chicago

I am a reader of **American Carpenter and Builder**
Send me one of your large 500 page catalogues as advertised in this paper.

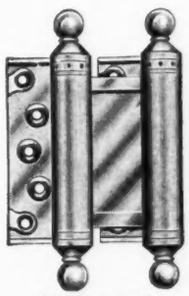
Name ______________________________

Address ______________________________

R. R. or P. O. Box ____________________ State __________

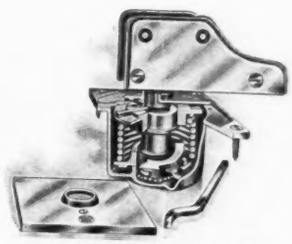
CHICAGO SPRING BUTTS

A Product of Recognized Superiority



TRIPLE-END
Double-Acting Spring Butt

CHICAGO
Double-Acting Spring Butt



CHICAGO FLOOR HINGE
Ball-Bearing

GOOD judgment should naturally be exercised in the selection of a SPRING HINGE most suitable to conditions and requirements. Our product is adapted to the varying conditions of automatic door operation.

BETTER recommendation could not be offered than the many years, extensive use of our product and the recognition of its many points of advantage in construction and general merit.

BEST of material and workmanship are embodied in our SPRING HINGE product, and our trade mark insures an absolute guarantee of quality and satisfaction.

The HARDWARE TRADE Will Supply Your Requirements

Chicago Spring Butt Company,
MANUFACTURERS
CHICAGO NEW YORK

Corrugated Round Expanding Conductor.
No. 28: Gauge Galvanized.

Slip Joint Eaves Trough. Single Bead.

THE EDWARDS MANUFACTURING CO.

"THE SHEET METAL FOLKS"
Main Office and Works: 401-417 Eggleston Ave.
CINCINNATI, OHIO.
Manufacturers of the Most Extensive Line of Sheet Metal Building Material in the World.

Illustration showing application of

The Edwards Metal Shingles
The Edwards Perfect Hip Shingles
The Edwards Queen Anne Comb Cresting
The Edwards Hercules Deck Cresting

The Edwards "Perfect" Hip Shingle

Made in Tin, Galvanized Iron and Copper. Size: 4x9 inches.

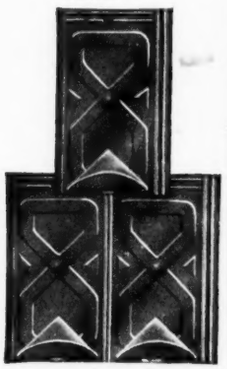
THE EDWARDS "IMPERIAL" RIDGE ROLL

The Edwards "Imperial" Ridge Roll For Shingle Roofs

Made of Best Quality Galvanized Steel in 10 Foot Lengths only

Makes a Neat Waterproof Cap for the Ridge of Roofs.

Made from one piece of Metal Folded as shown, the shingles being inserted into the folds over the nailing flanges, thus protecting the nail heads from the weather.



The Edwards Metal Shingle

Made of best grade Worcester Terne Tin, Painted or galvanized (galvanized after being formed), and pure Sheet Copper in sizes **7x10, 10x14 and 14x20 in.**

The Edwards Imperial Valley
For Shingle Roofs

No. 28 gauge Galvanized Iron in 10 foot lengths.

CORRUGATED IRON and STEEL ROOFING

Galvanized or Painted

We carry large stock and ship promptly. Write for 160 page catalog A-1.

THE EDWARDS ROOF GUTTERS

Made of best quality galvanized steel. In 10 foot lengths only
NO WOOD SUPPORTS NEEDED

Style A

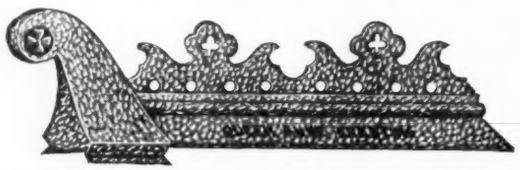
Made in 14, 20, 24 inch Girt, $\frac{3}{4}$ inch Bead.

Illustration shows style A as applied to roof in connection with the Edwards Metal Shingle.

The Perfect Roof covering.

THE EDWARDS QUEEN ANNE ORNAMENTAL ROOF CRESTING

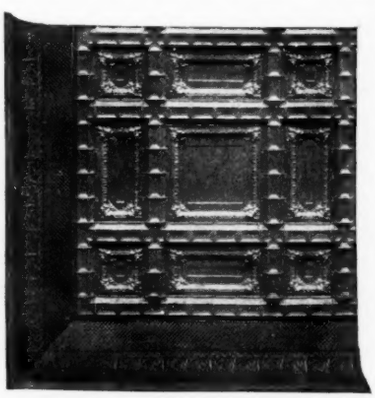
Made of Best Quality Galvanized Steel, in 10 Foot Lengths Only.
A Substantial Roof Ornamentation at a Low Cost.



The Edwards Metal Ceilings

The possibilities of Stamped Sheet Metal for interior decoration are unlimited, owing to its adaptability for Ceilings and Side Walls, in Churches, Schools, Halls, Public Buildings, Stores, Residences, in fact anywhere, being Economical, Sanitary, Ornamental, Permanent, Dust Proof, Moisture Proof, Fire Proof, Vermin Proof, and will compare favorably in cost with any other covering, length of service being considered. We show here our colonial design No. 1925, one of the many handsome and artistic Patterns illustrated and described in our new

Metal Ceiling Catalogue A. Sent FREE on request.



BUY OF THE MAKERS

We make HESS FURNACES in a modern factory, in large quantities, with all mechanical appliances possible to produce perfect work at low cost. We sell these furnaces *direct to the users* at one small profit above cost. We back up our sales with the strongest guarantees of quality and efficiency, and our customers have the benefit of our thirty-three years of experience in planning and installing heating equipments.

Our prices are surprisingly low, when you consider the high quality of our goods. For instance: Our No. 45 Steel Furnace will heat 7 to 9 rooms, or a good size store or church. The price, including lined galvanized casing, chain regulation, rocking grates, evaporating pan, etc., is $49.00 *freight prepaid* to any station east of Omaha. Six other sizes for other needs. Pipes and registers extra, at lowest factory prices. Ask us today to send you our free hand book "Modern Furnace Heating." It will interest you.

NORTH SOUTH

HESS

HEATERS

SATISFY

EAST WEST

Mo[illegible]gomery, [illegible] February [illegible] 1906.
Hess Warming & Ventilating Co. [illegible] The No. 55 furnace [illegible] my residence [illegible] well [illegible] I appreciate [illegible] your company, and take pleasure [illegible] your furnace. Yours truly, C. G. [illegible]

Rocky Ford, Colo., [illegible] 1906.
Hess Warming & Ventilating Co. [illegible] I have just installed [illegible] No. [illegible] Hess Furnace, and am glad to say that they have given entire satisfaction in every way. I think they are the best hot air furnaces on the market today. I would recommend them to anybody wanting a furnace, as I am satisfied that a person getting a Hess Furnace will make no mistake. Very truly yours,
G. C. HAWKEY.

Yalesville, Conn., February [illegible]
Hess Warming & Ventilating Co.
I have given the Leader Furnace [illegible] purchased of you last fall a fair trial, [illegible] found it perfectly satisfactory in every [illegible] find I saved quite a number of dollars [illegible] direct from the manufacturers and [illegible] your agreement to the letter. I found [illegible] culty in putting it together myself, as everything was made very plain in the directions [illegible] with it. I can heartily recommend the [illegible] to any one desiring an economical [illegible] furnace. Very truly yours,
FRANK E. [illegible]

Gainesville, Ga., February 6, [illegible]
Hess Warming & Ventilating Co.
In reply to your inquiry of the 3rd [illegible] say that your Leader Furnace has given [illegible] satisfaction so far. By buying direct [illegible] you saved me $125.00 on the best [illegible] could get elsewhere. Your dealing with [illegible] all I could have asked of any business [illegible] Very truly yours,
DR. J. H. DOWNEY.

Boise, Idaho, February 6, 1906.
Hess Warming & Ventilating Co.
In reply to your favor of the 3rd inst., I beg to say I bought two of your furnaces recently and they are giving entire satisfaction.
The Leader Furnace is all right. It is admirably adapted for this country and the fuel used here. It is the best [illegible] for soft [illegible] ever seen. I also wish to say the business [illegible] have had with you has been eminently satisfactory, everything has been as represented. The Hess Warming & Ventilating Co. are the kind of people one likes to [illegible]
Yours very truly
[illegible]KLEY.

Berwick, Ill., February 23, 1905.
Hess Warming & Ventilating Co.,
Gentlemen: Permit me to say that the Leader No. 55, which we have been using in our church building now for about three months gives unbounded satisfaction. We have certainly given it a strong test, [illegible] on Thursday, February [illegible] On that day we had a funeral at 11 a. m. The fire was started at 7 a. m., at which time the thermometer read 10 degrees below zero inside the building. When the service began, even though the double west doors had stood open a few minutes, the room was perfectly comfortable. Another gratifying feature is that the fuel consumption has been reduced very materially. The furnace is of such simple construction that any ordinary person can put it together. I shall take pleasure in recommending your furnace, and also the way in which you deal with your customers.
Yours sincerely,
(REV.) R. B. FAVORIG[illegible]
Pastor B[illegible] Church

Valparaiso, Ind., February [illegible] 1905.
Hess Warming & Ventilating Co.,
Gentlemen: I wish to say that I am very well satisfied with [illegible] With the assistance of my carpenter we installed the same in my new house, and I have never had heat as satisfactory as we are enjoying now. Up to the present time I have used only four tons of egg coal, while other furnaces in this city, which cost twice as much as mine [illegible] as high as twelve tons. Thanking you for the great bargain, I beg to remain,
Very respectfully,
(JUDGE) FRANK B. PARKS.

Muskogee, I. T., February 7, 1906.
Hess Warming & Ventilating Co.,
I take pleasure in saying that the "Leader Furnace" purchased from you in 1904 for my residence has given entire satisfaction. I wish to add, also, that my dealings with you have impressed me with the fact that your company is desirous of pleasing its customers, and that those who do business with you would receive both courteous and honest treatment.
Yours truly,
MRS. PRESTON C. WEST.

[illegible], Utah, February 14, 1905.
Hess Warming & Ventilating Co.,
[illegible]: "I am pleased to say that the No. [illegible] Leader Steel Furnace purchased of you in 190[illegible] has given the best of satisfaction. We are having [illegible] severe weather [illegible] and the furnace is doing its work [illegible] already been [illegible] to us of considerable more than fifty per cent. and I take pleasure in recommending it for its heating capacity [illegible] and [illegible] coal. We are thoroughly satisfied in every way with our furnace, and [illegible] your [illegible]
Yours very [illegible]
MRS. NORA EDDINGTON

[illegible] February [illegible] 1906.
Hess Warming & Ventilating Co.
[illegible] the entire satisfaction with which the No. 50 Leader Furnace purchased of you last summer and [illegible] the new M. E. Church in this place, has met, also of the method you have of dealing direct from factory to the user. I shall avail myself of every opportunity of recommending to any of my friends who want a good method of heating to try the "Leader," and your [illegible] ous way of handling your customers. Very sincerely yours,
M. V. KEITH

Wichita, Kan., Feb. 8, 1906.
Hess Warming & Ventilating Co.,
The No. 45 Furnace I ordered of you came through promptly and in good shape. I installed it myself without the help or suggestion of another person. We are well pleased with it in every way and [illegible] only [illegible] as the l[illegible]d we ha[illegible]ed with [illegible] desire to thank you for your generous treatment in our [illegible]
Yours [illegible]
[illegible] A. B. HESTWOOD.

Frankfort, Ky., [illegible] 6, 1906.
Hess Warming & Ventilating Co.
[illegible] which I bought of you last year has been perfectly satisfactory and is giving me splendid service. It is simplicity itself, is very easily operated and controlled, and is very economical in consumption of coal. We haven't noticed the slightest trace of coal-dust or coal-gas—in fact we are very much pleased with our furnace.
I [illegible] a long time as to whether it would be better to install [illegible] I had [illegible] a residence [illegible] not water [illegible] but am [illegible] prefer [illegible]-air plant [illegible]
You have always shown a desire to do everything I could expect of you, in fact, you are like your furnace—O. K. in every way.
Yours very truly,
J. A. POSEY

Snow Hill, Md., February 6, 1906.
Hess Warming & Ventilating Co.,
I have waited until now to write you about the No. 45 Leader Steel Furnace in order that we might test [illegible] as many [illegible] kinds of [illegible] as possible. Let me say first that I am already satisfied with [illegible] than expected [illegible] responds at once to every touch, so that in a few moments (quicker than any furnace I have ever used) one can reduce or increase the supply. Its care is the simplest thing possible and it is as solid as [illegible] cannot detect a flaw anywhere.
It has, however, a better virtue than this, a better one than its economy [illegible] and that, [illegible] strongest points, a[illegible] which I speak is that throughout all that concerned [illegible] delivery and [illegible] every other [illegible] all that [illegible] promised. This I value. Yours truly,
(REV.) JOHN F. KIRK

Whately, Mass., February, 15, 1906.
Hess Warming & Ventilating Co.,
In the fall of 1904 we put a Leader Steel Furnace in our parsonage and it served us so well that this season we put one in our meeting house. This also has served us well. Without trying to run it at its full capacity we have had a warm meeting-house even on the coldest Sabbath. The low cost of the furnaces, the ease with which they are run, the comparatively small amount of fuel used, and the [illegible] derived [illegible] recommend the Leader Steel Furnace.
Sincerely,
(REV.) WILLIAM N. [illegible] DEAN

Manistique, Mich., Feb. 8, 1906.
Hess Warming & Ventilating Co.,
I am very much pleased to express my satisfaction with your Leader Furnace, which I installed in my new eight-room residence last year. Everything came in good shape and I had no trouble in setting it up. It gives entire satisfaction—in fact it is all that you claim for it, besides, it is a pleasure to do business with such men as comprise your company. Yours respectfully
[illegible]N MOSHE[illegible]

Duluth, Minn., February 13, 1906.
Hess Warming & Ventilating Co.,
The furnace is giving me entire satisfaction. It heats my eight-room house and full basement thoroughly. The weather has been 25 degrees below zero. I saved at least $75.00 by purchasing the furnace direct from the manufacturer and have as good a hot-air furnace as there is in Duluth. Your way of doing business was both liberal and satisfactory to me.
Yours respectfully,
L. EWALD

Phoebus, Va., February 14, 1905.
Hess Warming & Ventilating Co.,
Gentlemen: [illegible] your Leader Furnace No. 45 in the fall of 1904, and erected the same with little difficulty. We have heated our [illegible] of 10 rooms very comfortably, though our hot air pipes have been without covering and [illegible] exposed to the cold air and stiff winds of Chesapeake Bay, while our unfortunate neighbor across the street has had bursted pipes on several occasions during the colder weather, and has one of the most expensive hot water outfits in the country.
MRS. I. M. LACEY.

Vaiden, Miss., February [illegible] 1906.
Hess Warming & Ventilating Co.,
• Your system of heating, using the Leader Steel Furnace which I installed in my new residence, has proved satisfactory in every particular, and will say that [illegible] man desiring a modern up-to-date home will certainly make no mistake in fitting his home with your system.
It is not only desirable from a standpoint of economy, but from a point of health and hygiene also. If I ever build another home I will certainly call on you. Yours truly,
[illegible] REHFE[illegible] D

Carthage, Mo., February 15, 1905.
Hess Warming & Ventilating Co.,
Gentlemen: I take pleasure in recommending your furnace to do all you claim for it and even more. For this winter we had 22 degrees below zero and I had no trouble to heat my house. This is the second furnace you have furnished me, and when I build again, you can rest assured [illegible] a third one.
[illegible]ctfully, [illegible]S AVONIA [illegible]

[illegible], February [illegible]
Hess Warming & Ventilating Co.
[illegible] the fall of 1905, I purchased [illegible] you one [illegible] Leader Steel Furnaces [illegible] and have [illegible] daily this winter heating [illegible] of [illegible] and while the temperature has been [illegible] degrees below zero [illegible] has been [illegible] all times. Its [illegible] of superiority [illegible] any furnace I have ever [illegible] are: simplicity [illegible] construction and management, more heat for the [illegible] and cleanliness. It being air-tight holds fire perfectly for twenty four hours, and in all [illegible] it is perfection in furnace [illegible]
T[illegible] received at [illegible] is all [illegible] of any dealer [illegible] say that I have had [illegible] success from [illegible] this winter [illegible] winter before in [illegible] Wishing you [illegible] I remain,
Yours very truly,
(DR.) T. BROOKS.

Lincoln, Neb., February 20, 1904.
Hess Warming & Ventilating Co.,
Gentlemen: I purchased one of your No. 45 Leader Furnaces last fall, and have used same all winter to my entire satisfaction. I can heartily recommend the Leader to any one in need of a [illegible] abundance of heat, and above all, any one with [illegible] can put it up satisfactorily. My [illegible] set mine up without any trouble [illegible] I could keep my eight-room dwelling comfortably heated in the months of January and February when the mercury was [illegible] and [illegible] below zero. I am proud [illegible] I find that I have not used near the coal that other people have with other furnaces; also find I have [illegible] as much as my son has in his cook and hot blast stove, up to date. Yours very truly,
[illegible]DLES[illegible]

Elizabeth, N. J., Feb. 13, 190[illegible]
Hess Warming & Ventilating Co.
Gentlemen: After a test of your furnace in the severest weather, I am happy to say it does all you claim for it and gives complete satisfaction. It is a quick heater, and easy to take care of. I am glad to credit Chicago with another "good thing." You have kept your agreements and I thank you for your courteous treatment. Yours truly,
WM. B. HAMILTON.

New York City, N. Y., February 12, 1906.
Hess Warming & Ventilating Co.,
The Leader Furnace I purchased from you for my new h[illegible] satisfac[illegible] is an [illegible] heater [illegible] an economical consumer of coal. Your [illegible] of piping [illegible] the arrangement perfect. I take pleasure in recommending the Leader to any [illegible] building, and always recommend hot-air heat as the only ideal [illegible] system for the home.
Yours very truly,
[illegible] T. McPHAIL, M. D.

Chapel Hill, N. C., February 14, 1906.
Hess Warming & Ventilating Co.
My first experience with the Hess heater led me to order a [illegible] which has been set up in our church and is doing good service. I recommend your [illegible] plan of [illegible] direct from the factory, and your honorable business methods. You make it possible for almost every church to secure economical and satisfactory heating.
Respectfully yours,
(REV.) J. W. WILDMAN

Nashville, Tenn., February 17, 1905.
Hess Warming & Ventilating Co.,
Gentlemen: In regard to the Leader Steel Furnace No. 50 that I purchased from you this last fall, beg to state that we have had an unusually cold winter here this winter, and my house has been very comfortable even though it has been below zero. I had no trouble in setting the furnace up, as it went together like clock-work [illegible] having a mechanic. Am very much pleased with the furnace, and also the business [illegible] which you handle your sales. With best wishes I am
Very truly yours,
J. [illegible] SOUTHA[illegible]

Sun [illegible], February 1[illegible]
Hess Warming & Ventilating Co.,
Gentlemen: Your furnace is giving splendid satisfaction. Your method of selling direct to the consumer is good, and your treatment is all that [illegible] desire.
(REV.) M. C. ROBERTS.

[illegible] Miss., [illegible] 6, [illegible]
Hess Warming & Ventilating Co.,
The Leader Steel [illegible] purchased from you and installed in our new brick building here is giving entire satisfaction. The cold [illegible] of November, 190[illegible] and January, 190[illegible] gave it a very strenuous test but it [illegible] requirements heating all three of the rooms in the building.
Your method of selling direct from factory to a good plan and it saved us from unnecessary delay. You sent us plenty of [illegible] connections, so that we had enough and some to spare, thereby adding to our pleasure, as we were in a hurry to complete our building.
Thanking you for your courteous treatment and assuring you that if we ever put a furnace in any building it will be a Leader, we are,
Respectfully yours
R. T. LIERBOE.

Hamilton, Ohio, February 15, 1905.
Hess Warming & Ventilating Co.,
Gentlemen: I am very well pleased with the [illegible]45 furnace purchased of you and would [illegible] the saving in coal by its use was over [illegible] cent. compared to the expense of previous years, using coal stoves. I shall require another of the same size for a new house which I contemplate building this summer. Wishing you continued success in your method of selling direct to the consumer, I am, Yours very truly,
WM. PILTON.

Woodward, Okla., February 12, 1906.
Hess Warming & Ventilating Co.,
[illegible] well pleased with the furnace, and by purchasing direct from you I effected a saving to myself of about 20 per cent.
Yours very truly,
(JUDGE) CHAS. W. WHITE.

Pendleton, Oregon, March 7, 1905.
Hess Warming & Ventilating Co.,
Gentlemen: For the past six months I have had installed in the basement of my 22-room house a Hess Furnace, and have used no other means of warming the rooms, and while the pipes from the heating plant are so arranged as to carry heat to the sixteen rooms on the two lower floors, yet the hot air circulation was such that the rooms of the third story were always comfortable, even when the thermometer registered several degrees below zero on the outside. The furnace is [illegible] economical in the use of wood and coal and the expense of fuel has not been one half as [illegible] would have been had I used stoves to heat the same number of rooms. I take pleasure in commending the Hess Furnace to any who [illegible] contemplate putting a heating plant in the house, as it is cheaper and fulfills the requirements better than any other furnace I have ever known. Respectfully,
J. F. NOWLIN.

JAMES McCONNELL.

[illegible], February 6, 1906.
Hess Warming & Ventilating Co.,
I am more than pleased with the furnace purchased from you, and can also say that it heats our eight-room house to perfection with less fuel than it takes to run an open grate we have in one room. Should I need another furnace would certainly buy a Leader, and would recommend the Hess Warming & Ventilating Co. to any one thinking of installing a furnace as one of the most accommodating and reliable firms I have dealt with in my thirty-five years of business life.
Respectfully,
WILLIAM L. SWARTZ.

Lonsdale, R. I., February 27, 1905.
Hess Warming & Ventilating Co.,
Gentlemen: [illegible] me to say that the Leader Furnace purchased of your firm in 1902 is still in operation giving satisfaction, in good condition, costing nothing for repairs. We are pleased with it.
[illegible] M. ALBERT BROWN.

[illegible], S. D., February 23, 1905.
Hess Warming & Ventilating Co.
Gentlemen: In reply to your letter of the 11th inst., I wish to say that the furnace is still doing business in a very satisfactory manner. During the recent unprecedented cold snap it proved itself equal to all demands made upon it, and never failed to provide full measure of warmth and comfort for the home. It has been a great fuel saver also, having a great advantage over any other make of furnace in this city so far as I can learn. My fuel consumption is a wonder to my neighbors. I have burned 2½ tons of hard coal so far this winter and have heated a five-room house thoroughly. I am more than gratified with the durability, practicability, and all round ability of your furnace. Two of the grates have warped and sagged, but this was entirely my own fault. I allowed the ashes to bank up under the grates with a hot fire above. Respectfully yours,
D. SHARP.

Pitts[illegible], Texas, F[illegible]
Hess Warming & Ventilating Co.,
[illegible] your favor of the 10th [illegible] came du[illegible] hand, and in reply will say I have used your furnace at Bryan, Texas, where they gave good satisfaction. I found them surprisingly cheap. [illegible] there is another furnace made that is equal to the Leader as a matter of economy. I [illegible] so well, [illegible] just installed [illegible] No. 58 [illegible] which are doing finely [illegible] begin[illegible] have the liberty of using [illegible] name [illegible] wish, as [illegible] ever [illegible] Leader [illegible] Sincerely,
(REV.) E. L. S[illegible]LES.

Free Carpenter's Pencils, two of them, the best and highest priced in the market, will be mailed you, in exchange for three or more names of owners in your town, who will buy furnaces. Send in the names and mention this ad. A postal will do.

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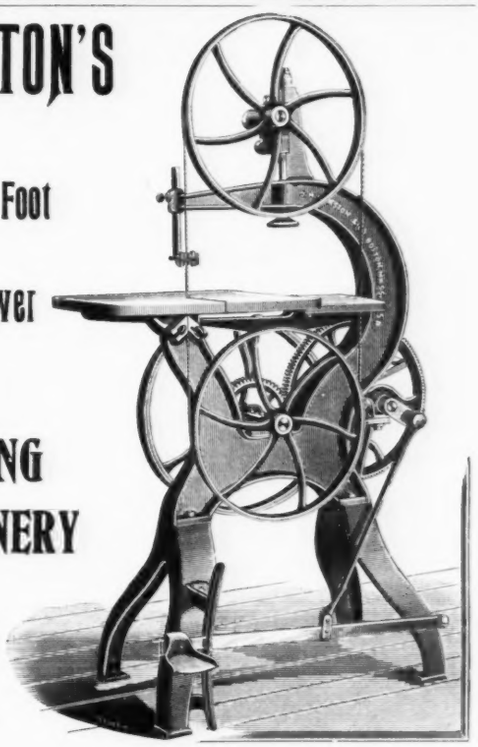

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The Largest, Best and Most Practical Trade Journal in the World for the Carpenter and Builder

SPECIAL CARPENTERS' NUMBER

American Carpenter and Builder

Entered as second-class matter July 1, 1905, at the postoffice at Chicago, Ill. under the Act of Congress of March 3, 1879.

WILLIAM A. RADFORD, EDITOR-IN-CHIEF.
WILLIAM REUTHER, EDITOR.

Published monthly by

American Carpenter and Builder Company
196 FIFTH AVENUE, CHICAGO.
O. F. BYXBEE, General Manager.
E. L. HATFIELD, Assistant Manager.

VOL. II. OCTOBER, 1906 No. 7

The AMERICAN CARPENTER AND BUILDER is issued promptly on th first of each month. It aims to furnish the latest and the most practical and authoritative information on all matters relating to the carpentry and building trades.
Short practical letters and articles on subjects pertaining to the carpentry and building trades are requested.

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HE who attends to his own business is never out of a job.

✣

ONE good way of running a small carpenter machine shop is to run it for profit.

✣

ALL things may come to him who waits, but we are under the impression that part of this saying has been lost track of, and that is that man should work while he waits.

✣

SO many men have the faculty of never being on hand when wanted that the world soon learns to get along very nicely without them.

✣

IN THE very formation of our bodies and brains there are a thousand evidences that we were planned and equipped in every detail of our marvelous structure to achieve great things, to accomplish something worth while; and it is a disgrace not to live up to our birthright.

✣

The Kind Wanted

THERE is still room for argument in favor of "side face" and "down face," but we all agree that the important thing is to have the face properly finished no matter which way it is done. That's what the buyer looks at—the finish. He does not inquire whether it is done "side" or "down," just so it's done right, and it is pleasing to note that the manufacturers are beginning to realize this.

✣

Carpenters and Concrete Construction

THE popularity of concrete in the structural world, instead of curtailing the use of lumber and doing away with the services of the carpenter seems to be enlarging the demand for both. This is due to the fact that many big buildings which might have been built of steel, stone and brick are now being built of concrete, and in this work it takes a large amount of lumber and a great deal of work to make the forms, more in fact than would have been used in a brick building.

✣

Reputation and Confidence

THE best and most profitable way of erecting a building is to build a reputation at the same time upon which future work can be obtained. To build a house which is a disappointment to the owner, no mat-

ter how large your immediate profit may be, will be your ultimate loss.

Every building you erect should be a standing advertisement for securing future business. This often leads to a discussion with the owner, but, as a prominent lumberman said, "every house owner loves to bargain, if you sell him cheap lumber he will be dissatisfied and not come back to you, but if you sell him good lumber at a higher price he will remember the quality of the lumber and forget the price and come back to you."

The best builders, those who are in the field to stay and upbuild a continually growing business, do not misrepresent their work in any manner, and in that way get the confidence of the owner. Confidence is a vital factor in any business and its presence or absence will show itself in a very short time. Get the confidence of the community and you will have plenty of work to do and this confidence builds up your reputation.

Care must be taken not to betray this confidence, for that which has taken years to build can be destroyed in a short time, never to be restored.

Style in Architecture

IT IS often said that style is the language in which an architect expresses his ideas, and there is much truth in the saying, though many architects have acted, and still act, as if style were the idea itself. To make a building subordinate to style is much like making an essay subordinate to the language in which it is written. An architect's ideas may be conveyed equally well in many different styles, but just as few writers can express themselves with perfect grace and ease in any other than their native language, so there are few architects who can produce architectural work of real merit in any other style than that which they have learnt by long custom, or, in other words, than that in which they have been brought up. The young man who wishes to rise to eminence should train himself upon the best work of the best periods, and not studiously measure buildings of a mixed character, saturating himself with misconceptions and imbibing faulty ideas of proportion and construction; but he should bear in mind all the time that the ideal at which he aims is not copyism, but development.

The great hope for the future development of something truly national in larger works, and truly modern in its spirit, is to be derived from the coming of new methods of construction. Just as arch construction necessitated great changes, and eventually led to the production of an entirely different style from that which had preceded it, so perhaps will the adoption of steel and concrete construction in the future lead to as great a change. If it follows precedent it will develop from below, and consequently upon the lines which have become universally accepted in modern domestic work.

What Carpenters Need

SHOULD anyone ask what carpenters need most in a locality where trade is dull, I am afraid the majority would answer "Work," without even thinking what they would receive for their work.

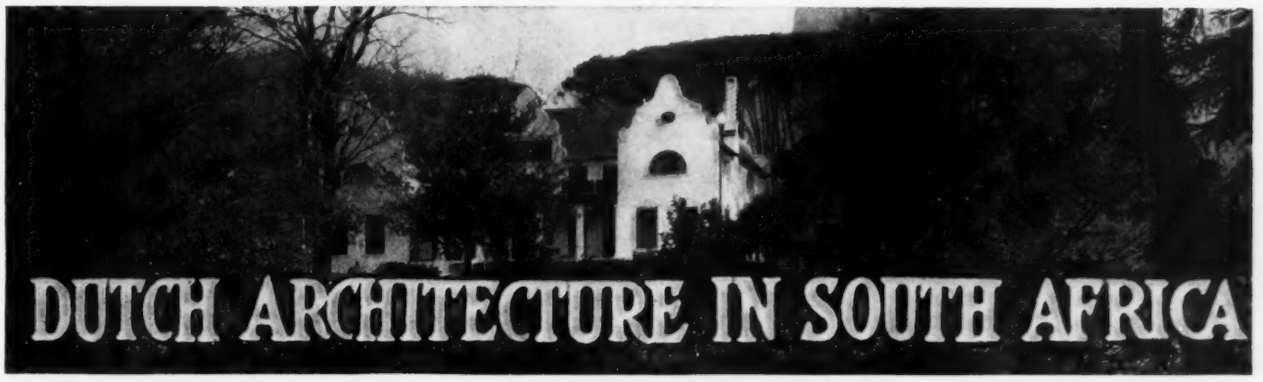
If the same question were asked in a locality where work was plentiful, the answer would likely be that more wages were wanted, and if asked in the small town where they work ten hours, and knowing they only work eight hours in most large cities, the answer would probably be a shorter day. While work and wages are important needs of carpenters, yet they should not lose sight of the fact that there are other needs in this world, besides the almighty dollar.

I have been on many large jobs and found the tools so dull that it seemed as if the only things that were needed here were grindstones and files. Any carpenter, who expects to live his allotted time, needs sharp tools, as nothing will wear out one's life like pushing dull tools day in and day out, although one's life may be dashed out much quicker by careless construction of scaffolding.

Some may say the carpenter trade is not dangerous, with which I agree, yet I will ask whoever worked at the trade for years, and has not seen many carpenters dashed to the ground and either killed or very seriously hurt by material and even tools falling from above on the workmen below. It is true many localities now have laws which compel construction of temporary floors and preventing many of these accidents. Yet these laws at first were ruled out on some technical point until the contractors realized that it was cheaper to protect their workmen than to kill them.

Another place where the almighty dollar plays a very important part, and prevents many good carpenters and builders from doing honest work, and that is where men have some cheap lots and want to build cheap houses to sell. These are built purposely to sell to the uneducated to whom all houses look alike. Still one could be built with matched lining and paper all over the walls and floor, while the other would be just thrown up and have only the cheapest kinds of floor, siding and no lining at all. It is true that most of the large cities now have laws forbidding anyone from building houses as cheap as many would like. Every honest carpenter should do all in his power to enforce this law. In the large cities the laws and also the architect are a great protection, yet I will have to admit that some of the worst work that I have ever seen was worked on a good architect on a large state building.

The carpenter should be on the square and be able to go to work knowing that his life will be perfectly safe and be able to return home at night knowing he has done an honest day's work, not only to himself, but to the contractor, architect, and owner as well, not only an honest day's work to just "us four and no more," but also to anyone who may buy or be interested in the property later on. DWIGHT L. STODDARD.



DUTCH ARCHITECTURE IN SOUTH AFRICA

By J. R. White

THERE are many attractions to allure one into visiting a South African farm. The old farm houses are well worth seeing in themselves, and then the hospitality one finds in African homes, especially in the country, is as simple as it is delightful. In the immediate neighborhood of all villages many farms are within easy walking distance.

A brisk walk of an hour or so is rewarded by a warm welcome, a cup of strong black coffee, and then an invitation to visit the orchard or the vineyard. Early in the season the trees are laden with apricots and loquats, and the strawberry beds redden the ground for acres. Later one may have a feast of peaches and most luscious grapes in endless variety. In the winter season when the days are cold and nipping, the oranges and guavas ripen.

We had walked one winter morning to a near-by farm, and as our host took us through the orange grove we looked back at his picturesque home half hidden by the great oaks, and exclaimed involuntarily on the beauty of it all.

"The Dutch farmhouse suits its surroundings," someone remarked.

Back Porch of Cecil Rhodes' Residence

"And it suits the climate," responded our host. "Our forefathers knew what they were about," he added, with the pride of a man who could claim a long line of Dutch ancestry.

The thatched roof in this country is not devised for

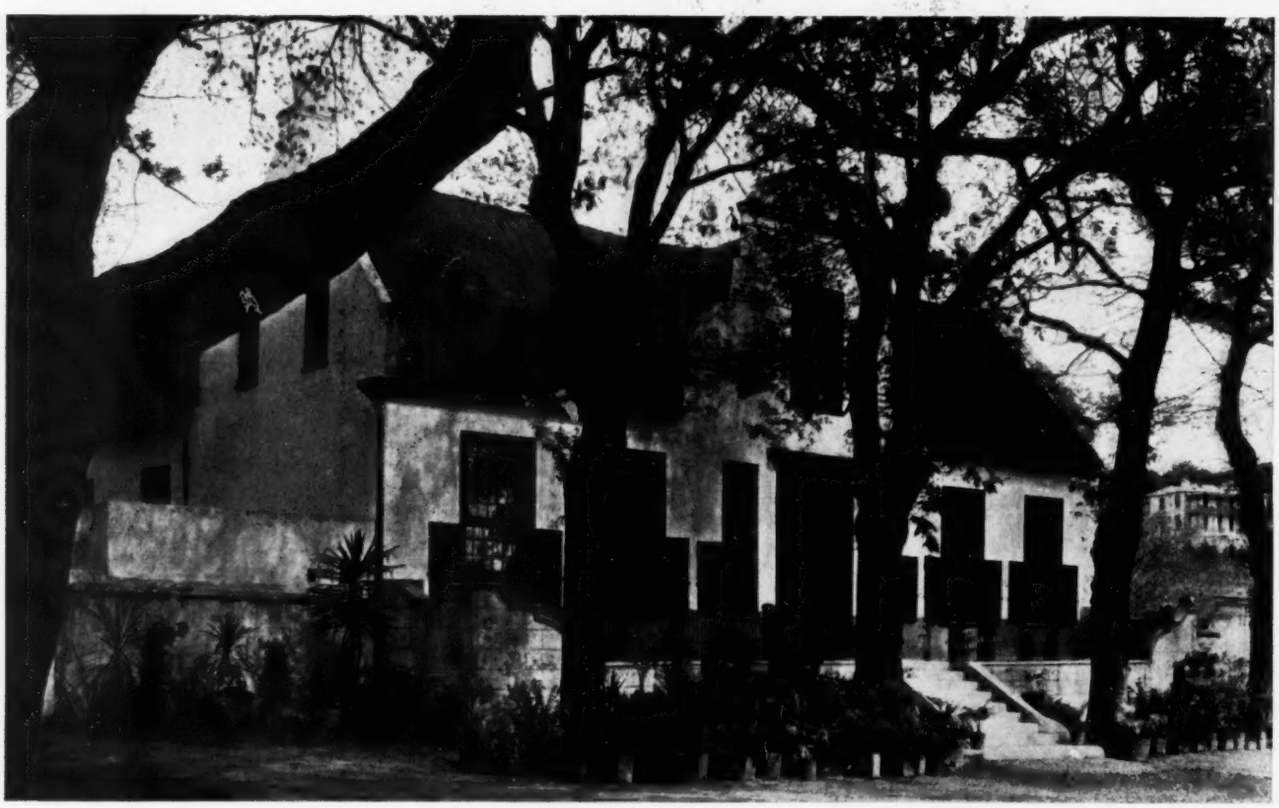
Front View of Rhodes' Residence

effect. It shuts out the heat of summer. A roof of tiles would be too expensive to be considered for the ordinary farm house, for the tiles would have to be imported from Europe. A shingled roof would be a curiosity in South Africa where wood is too scarce to be cut up for such purposes; besides the climate would make such a roof impracticable.

Our farmer friend explained that the walls of his house as well were built with a purpose. Through several thicknesses of brick, coated over with cement, even the African sun cannot penetrate.

The small Dutch windows with their many panes of glass, open outward and are protected by heavy wooden shutters. They are picturesque always, and cheerful enough in summer, but give the guest who tarries within a sensation of darkness and dreariness during the days of winter.

The ponderous Dutch door lends a finishing touch.



An Old Dutch Dwelling, Cape Colony

In the old houses it is divided into an upper and lower section. In many cases where the door is a solid panel the farmers have had the taste not to mar the beauty of the rich weathered teak with either paint or varnish. Simple carving decorates the door, and sometimes a massive ancestral knocker.

The Dutch type of house is characterized by irregularly rounded gables. This ornamentation is in the center rather than at the ends. Sometimes a great

Old Dutch Farm House, Cape Colony

single gable ornaments the doorway, but in the more pretentious houses the gables are in pairs. The resulting contour is always graceful and dignified.

The Dutch kitchen in South Africa is a delusion and a snare, and it is in many cases quite as well for one's appetite if one refrains from penetrating into this dark region. A barefooted Kafir or Hottentot reigns here, and she learns slowly the ways of modern housekeeping. The dirt floor is considered tidy when freshly smeared with cow dung. When this is mixed with blood the floor is as hard as cement, and has a not unpleasing polish. Although the idea seems distasteful, the floor is effective and serves its purpose.

Many of the features of the kitchen were brought from Holland; the oven is built into the wall in true Dutch style, and the great chimney is outlined in considerable proportions on the outside of the kitchen. This room, like all the others, has its lofty ceiling adorned with massive exposed rafters of teak.

If one associates with a Dutch kitchen the picture of rows of shining copper kettles, a neat array of mugs and a trim, hustling housewife, such a pleasing fancy must be modified for an African Dutch kitchen. Here there is the slow-moving, untidy Kafir or Hottentot servant, whose kitchen with its dirt floor and its confusion is as near a reflection of her native hut as a scolding mistress will allow. People who have many servants must pay a twofold penalty—deterioration in their own physical vigor and the final punishment of being ruled by their servants. Colored help is so plentiful and so cheap in South Africa that the African descendant of the proverbial scrubbing and cleaning Holland housewife bears about as much resemblance to this type as her New York society sister of the present day.

There is something very quaint about the front *stoep* of an African farm house, outlined as it is with stiff plants in their painted kerosene tins. It is usually unroofed. When a protecting cover of corrugated iron painted in stripes of red and white is added, it shows that the present owners think more of comfort than of effect.

Just as in Southern California the wealthy have been discriminating enough to see that they could not improve upon the beauty and the utility of the old Spanish mission style of architecture, so the Englishman in South Africa has been wise enough to borrow

his ideas from the Dutch patterns of the seventeenth century. The homes in South Africa that are most closely modelled on the style of the early Dutch dwelling are certainly the most beautiful. Near two of the suburbs of Cape Town, Wynberg and Rondebosch, are to be found the finest specimen of the real early Dutch house and its modern English imitation. In about 1790, Simon van der Stel, governor under the Dutch East India Company, laid out his wine farm near Wynberg. The great farm house he built with much thought and care, and it stands to-day practically just as he left it. His wife refused to come to such a remote and forsaken country as the southern end of Africa, but he found consolation for her absence by erecting a life-sized statue of her in the niche over his front door. The old chronicles say that it was perhaps in scorn of the inconstancy of his wife Constance that he named his estate "Groote Constantia." The long teak benches are still in place on the wide stone stoep, and we can imagine the company of portly Dutch burghers that met there on sunny afternoons to discuss political affairs, while they smoked their long Dutch pipes.

To-day Groote Constantia is the government wine farm of Cape Colony, but everything that speaks of the early days of van der Stel is carefully preserved. The furniture is of the most substantial Dutch type, and the heavy tables, chairs and wardrobes would fill with delight the heart of a furniture collector who loves things antique. The connoisseur in wines would perhaps find as great delight in the immense, cool vaults, where in tuns, great and small, the wine is stored.

During the whole period of the rule of the Dutch East India Company in South Africa—a period of a hundred and fifty years—there was one sculptor. He has left few works to testify to his genius, but there is a beautiful model standing in relief on the front wall of the old wine vault. The sculptor's name was Anthon Anreith, and this work represents the vintage and Bacchus.

Five minutes' walk from van der Stel's house is his deep bathing pool paved in granite, with stone step leading down to its depths. A trickling stream of clear water from the mountain sources near by issues from the trumpet in the mouth of a playful Cupid, leaning out from a niche in the wall high above the water's edge.

It is not strange that Cecil Rhodes found in van der Stel's home a type he was proud to imitate. Not that the Rhodes house, Groote Schuur, is a servile imitation—it combines rather all that is best in Dutch architecture. Many travellers have declared it the most beautiful house they have ever seen. It is neither large nor pretentious, but every inch of it is in perfect taste. A winding path through an avenue of stone pines shows a vista of hills beyond. A turning brings us to the front stoep. Over the doorway is a great bronze tablet depicting in relief the landing of van Riebeek and his little company who came to the Cape in 1652, under orders from the Dutch East India Company, to start a refreshment station for the company's ships sailing to India.

The pictures show the plan of the house, but no picture can give any idea of the richness of coloring of the natural woods and the simple harmony of the furnishings. No price was too great for this lover of things beautiful to pay for the pieces of old Dutch furniture that he chose with so much care and pleasure. The wide back stoep looks across a sea of blue hydrangeas to the bluer hills beyond. Comfortable old settees and great brass bound teak chests, firm as ever after many a stormy ocean voyage, furnish this wide veranda.

If one wishes to see how these more splendid types of Dutch architecture may be adapted to a modest modern home, there within stone's throw of Groote Schuur on the Rhodes estate is the home where Rudyard Kipling comes every year to escape the severity of English winters, and possibly the greater severity of English critics.

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A Great Concrete Chimney

Out in Butte, Mont., where the great stamping-mills and ore-concentrating works have turned the mountain city into a titanic inferno of tall chimneys, belching black and sulphurous fumes, stands one tremendous tower, the top of which is 350 feet above the ground. When its erection was planned the first idea was to build it of brick. That would have required a thickness of twelve or fifteen feet of masonry at its base. But a constructing engineer from Chicago was called into consultation. He proposed that the huge chimney be built of concrete, and, with some misgivings, the plan was adopted. He prepared a foundation six feet deep, twelve by twelve, of concrete, with a number of steel reinforcing rods. Beginning at the ground level, he carried two thin concrete shells upward for 100 feet. The outer one is only nine inches in thickness, while, separated by four inches of space from this, is an inner shell five inches thick. At a height of 100 feet these two unite into a single seven-inch shell of concrete, which extends skyward until the vast height of 350 feet is reached. This chimney, many feet higher than our modern city skyscrapers, is therefore composed of but fourteen inches of concrete at the base and half that amount for the upper 250 feet. It is not of plain concrete, but is reinforced both horizontally and vertically with a number of small steel rods, which were held in place until the concrete had been deposited around them, making a reinforced-concrete body superior in every way to both steel and brick masonry. There are in the United States scores of these wonderful chimneys.

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When a man starts in to pave the way to success with promises, he must expect to make the promises good or he will soon have rough going.

Nursing a Job vs. Cultivating Trade

BY J. CROW TAYLOR

"I'VE got it," said J. B., as he came down from the roof of a house he was shingling and joined Mosby, Uncle Rural and Lefty, preparatory to have the mid-day lunch.

"Got what?"

"Got an idea."

"Oh!" said Lefty, "I am beginning to breathe easier. You had me scared for a minute, for I thought maybe you've got something that is catching, but if it's just an idea it will keep, and I guess it won't hurt you much."

"No, I don't think it will hurt me much either, but I hope it is catching though, or at least I can get some of the rest of you to become infected with some idea and use it to good advantage."

"Well, if it won't keep until after dinner spit it out, and let's have it over with."

"Never mind, Smarty, when you get a little older you will begin to have some ideas, too, and know how it feels, especially how it feels to have some one make sport of you. I have been studying all morning on this problem of cultivating business. Of salesmanship or whatever you may call the thing that will help us get more business and better business. And, the idea I've got is that the main thing is not so much to encourage a man to build as it is to encourage him to build better and more extensively than his original plans call for. I got a pointer the other day down at the lumber yard from the manager, who was explaining that he did not handle much low grade stock, and said that after a man buys lumber and pays for it he forgets the original cost and his likes and dislikes are influenced solely by the quality of what he has got. In other words, the man that buys good stuff is pleased with it after he has it, and being pleased with it he comes back to the same place where he got it, and gets some more when he is in the market again, while, on the other hand, should he drive a bargain and afterwards become displeased with the stuff, he is very likely to go after material somewhere else the next time he is in the market. The pleasure of bargaining is only temporary, and the lasting pleasure, the kind that makes a man come again and feel glad of it is the getting of something that is good and worth while. Now, then, apply this same idea to the carpentry trade, and I see where by encouraging a man to build better and probably more extensively than the original plan there is not only a chance to get lots more work, but also to leave the man better satisfied with the results. There is too much tendency when a man goes to building a house to make use of the bargaining instinct and figure out what is the cheapest way of doing it. There is a certain amount of this bargaining instinct inherent in the American make-up, but I believe a lot of it is due to the lack of specific ideas, of lack of cultivation and development, or definite ideas of just what they do want when it comes to home building. That's why we find a man giving trouble now and then by coming around and making changes in his plans from day to day when some one makes suggestions to him, or as a new thought occurs to him. It is a problem we had up for discussion once and Uncle Rural told us the thing to do was to make a man want what we had to offer him or what was in his plans, so that he would not always be changing them. Adding this new thought of mine to that, I figure it out that it's up to us to engage, cultivate and shape the interest of the man we are building for by developing new thoughts and suggesting this or that, adding to or altering the original plan so that when the building is complete it will cost most, but will be better than the builder expected originally, and after he forgets the cost he will be pleased with it."

"J. B., I see where you are going to get in trouble with Uncle Rural in about two minutes and a half," said Lefty. "Did you not get a lecturing at one time from him on nursing a job? And what you are talking about now sounds a little bit like nursing a job, but it makes me think more about a barber we've got that landed down here from St. Louis. When I go into the shop to get a shave he first wants to cut my hair, then he wants to give me a face massage, when he gets through shaving me, then a seafoam. In fact, he insists on offering me every service the shop affords every time I go in. It's such a habit with him that it's got to be second nature, and grew out of the St. Louis barbers' idea of working their job for all there is in it, or rather working their patrons. That's what this idea of yours sounds like; it sounds like working a man for all you can get out of him. Ain't I right about it, Uncle Rural?"

"No," Uncle Rural replied, "you are not right. There is quite a difference, as well as distinction between working a man and giving him good counsel. J. B.'s idea is good, and while it is true that some people might take this same idea, like they do the world over, and abuse it, these features we can never get clear of. But, because an idea is likely to be abused by some one is no reason whatever for it not being used if it is a good one. It is a carpenter's duty to study and develop new ideas in building and wood work, to supply these ideas to would-be builders, and naturally he should get as returns for his trouble an increased amount of business. On the other hand, if a man just drifts along, does what he is called on to do and don't have anything to offer himself except his services as a skilled worker, he will never amount to a great deal. I might add that that is the trouble with most carpenters; they allow themselves to drift too much. Some people call it getting in a rut, but no

matter what name you call it by it's a thing that a man must get rid of if he expects to ever distinguish himself. We don't want to drift with the current, but set up a little cross current of our own. We don't want to lose our identity in a beaten path or rut, but strike out and make a way of our own. To do this we must develop individual thought; not only develop it, but make use of it, and the proper way to use it is logically contained in J. B.'s idea. Use it by encouraging a man to build better than he probably intended to build. Not only better, but to include in his building features of individuality. We are reaching an age in this country when home builders as a rule are prepared to expend much more in the erection of homes than ever before, and there is a general desire to build better, so that all we need is for somebody to shape it into a definite form, and that's where the carpenter should get in his work."

"Speaking of individuality," said Mosby, "it is all right I guess, and I have noticed by the papers that it is a feature of the building operations during the past year or two, but when the idea of individuality gains headway and becomes a fad, so to speak, it soon begins to take on freakish tendencies or abnormal features here and there, and what was at first a good idea develops into a passing fad that takes on grotesque chacteristics here and there, has but little more staying qualities than the fashion in women's hats.

"I've got it," said J. B. as he came down from the roof of the house

The man that falls a victim to it finds himself after the storm has passed in the possession of a home that attracts attention a minute simply because of its freakishness and not because of any natural beauty."

"Oh, well," said Uncle Rural, "that would be another case of a good idea running amuck when it gets to leading individuality into the land of freaks. Still, it's better to make a freak or two than not to not make anything new, and in this respect even freaks serve their purpose in a way, as they help to pull us out of ruts and start us on to a new plane of thought. Go to the cement plant, or go to any large industry, and look at a lot of company houses if you want to see an extreme idea of lack of individuality, and then you will be ready to admit that even a few freak houses mixed in to break the monotony of a lot of company houses making up an industrial village would be a relief. But, as in the case of J. B.'s idea that Lefty jumped onto, there is no need to be freakish. A man can display individuality and still play in harmony, so to speak, especially if he has a natural eye to beauty."

"An eye to beauty?" chimed in the voice of Lefty. "That's J. B., all right; didn't you notice him Sunday?"

"I noticed him," said Mosby, "and I also observed that J. B. is not the only man that has an eye for beauty of the feminine kind, but you boys are off the track a little. There is another kind of beauty besides the kind that wears skirts; it is beauty in designing, and equiping of houses that Uncle Rural has reference to."

"Well, then," said Lefty, "just what is beauty?"

"Beauty, my boy," said Uncle Rural, "according to the old Roman definition is 'multitude in unity,' or, as we might translate it to read to-day, a harmonizing with local surroundings and conditions. To use this in the broad sense, it not only means that you should not build a mansion on a little 2 by 4 lot, or a shack on a big plantation, but also that detailed design and coloring and everything should harmonize with the surroundings so that every part of the landscape should look like it belonged there and is not a false note or a borrowed bit of some other widely different part of the country. There are many other definitions of beauty, the most popular one for boys of your age applying to the feminine type, and these are not to be forgotten in any way or at any time or place, but there is room for an extensive study of the subject of beauty as applied to designing and building homes, and it is in this study that a man should develop his individuality. Moreover, when it is developed under conditions of this kind of consistent study of what really constitutes harmony and pleasing effects—a study in which you should always remember that simplicity and not complexity is the best keynote—there is not much need to worry about the element of freakishness outcropping very seriously, for most of the freaks are the result of abortive ideas begotten by an untrained desire, and are not the result of carefully trained and well-formed theories that come from persistent study. That's where J. B.'s idea fits in, and it's a good one, one that I hope you boys will follow up. There is no need to tell the people that they want to build homes; there is an inherent desire in the human race to build homes, and the best place for the exercise of your talents is in developing that desire until the prospective builder will build better than he intended, build a home of which he will be proud in the future and which will reflect credit on the builder. You just stick to that idea and get some of the other boys to take it up, too, for it is a good thing that every man can push without hurting anybody."

Secret of the Pyramids

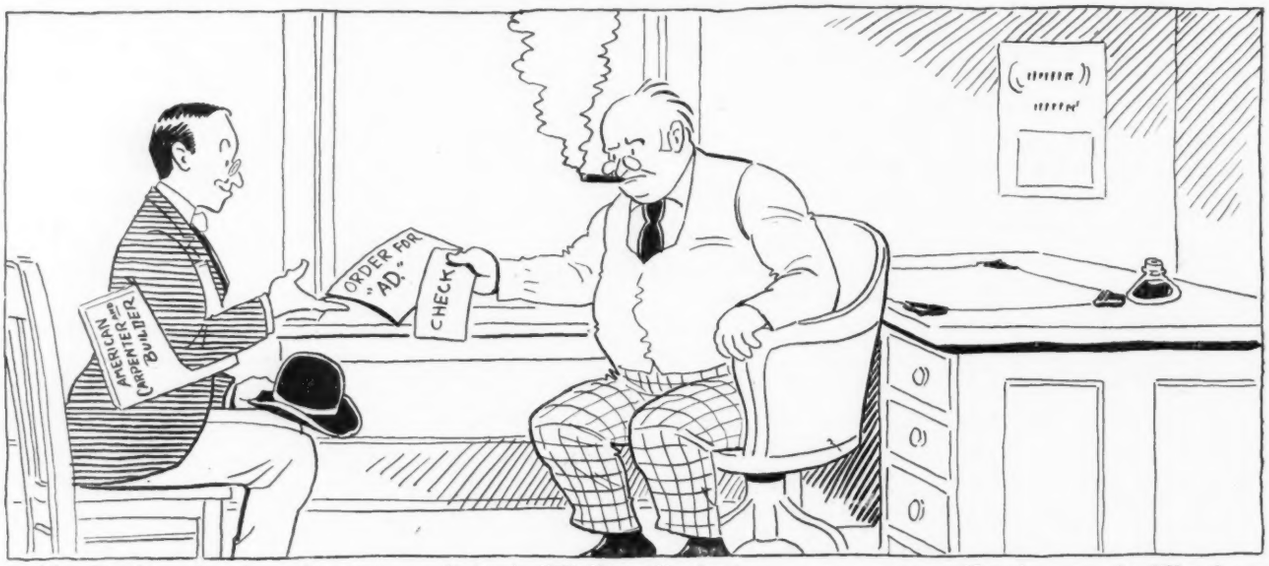
A Brooklyn engineer of note, who spent several years in Egyptian exploration, is of opinion that the mystery of the pyramids has been solved. The most extraordinary pictures showing 200,000 men hauling on a rope to raise a 200,000-lb. stone into its proper niche near the pinnacle of old Cheops is familiar to all of us. Theories as to the mode of construction are legion. But all the engineering logic and experience of to-day and for the last 100 years has failed to cast more than a shadow over the mystery. Piazzi Smith thought he knew all about it, but nothing of a practical nature has come of his researches.

It is singular that our wise men did not think of examining with critical eye the tools found in the catacombs. The old saw—a workman is known by his chips—is no better than a workman is known by his tools. Our Brooklynite says that the tools are not those of rock masons, nor mere plasterers' implements for filling the cracks between stones, but are plainly the crude Egyptian plant of operatives engaged in mixing and laying cement. What a splendid patch of sand they had as a foundation for their cement!

Cement is the coming building material. Railroads are renewing their steel, iron and stone piers, abutments, culverts, etc., with it, and it is expected to last forever. No great skill is required in manipulating it. There is no chiseling, hammering, doweling, no heavy lifting with derricks, no misfits. The industry already has grown to enormous proportions. Drop a sack of dry cement to the bottom of a river and in a few minutes you have a solid stone that never will wear away. Drop 1,000 sacks on top of it and round it and presently you will have a foundation that will sustain for all time a million ton bridge.

The price of good quartered oak is now getting so high that furniture manufacturers and others using this class of material extensively are not only talking about mahogany, but they are taking it up and figuring that there is very little difference in the cost of a piece of furniture made from quartered oak and one made of mahogany. Take a table that retails for about $25.00, for example; there is not really much more than a dollar's difference in the cost.

Mr. Doubter and the Advertisement



Mr. Doubter (to the advertising solicitor)—"Well, well, don't say any more. Here's my ad.; I'll take a chance anyway."

"There's some more money gone, but I got rid of him. The best thing I can do is to forget all about that magazine."

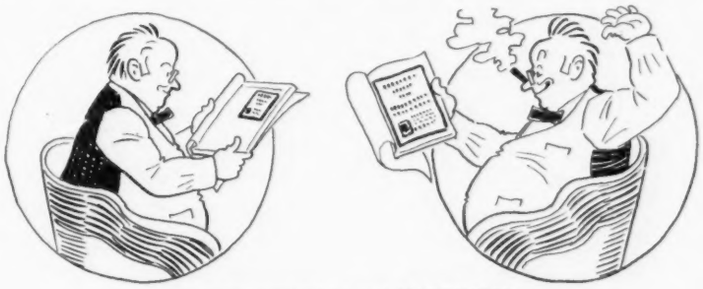
But after the answers began coming in Mr. Doubter couldn't do it.

Short Talks With Our Subscribers

OUR cartoon this month depicts a condition which may be a little exaggerated—but only a little. The letters which advertisers receive from our subscribers may not be piled in a promiscuous heap, like that shown in the third illustration, but they get the replies just the same. Many and many an advertiser is induced to try an advertisement in the AMERICAN CARPENTER AND BUILDER, not expecting to get any greater results from his announcement than he has secured from other advertising in the past, and Mr. Doubter's suprise is no greater than that experienced by hundreds of others.

Advertising Doesn't pay—He has Tried it. No, not in the American Carpenter and Builder.

In this little talk with our subscribers we are going to take them into our confidence and tell them something about the advertisers who assist us in making our magazine so valuable. Without the aid of the advertiser we could not give them such a nicely printed magazine, so many practical articles, so many fine illustrations, nor many other things which go to make the AMERICAN CARPENTER AND BUILDER "The World's Greatest Building Paper."



THE DEGREES OF HAPPINESS

The Small Space — The Larger Space

The members of our great family of subscribers all realize this, and they are interested in seeing just as much advertising as possible in the magazine, for they know the more advertising there is the better magazine they will get. In order to be of the greatest possible assistance to the magazine they have with one accord determined wherever they can to buy the materials advertised in its pages when in need, and wherever possible to buy direct from the advertiser. This accounts for the great results which advertisers secure when they use our magazine.

"Advertising Costs Too Much"

Our readers have found that we accept none but reliable advertisers, and they also find that they can secure better prices, prompter service and more satisfactory treatment in dealing direct with these advertisers.

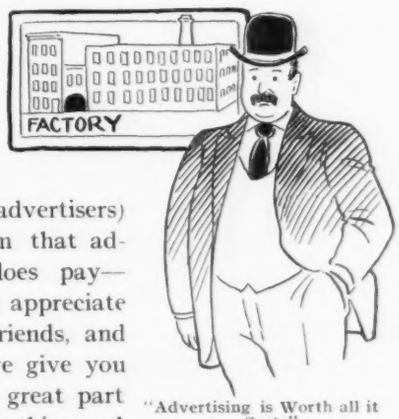
The illustrations on this page give a little idea of what our experience has been with the advertiser "before and after using." First, we have the man who has advertised, and he knows all about it—"it doesn't pay." He admits he never used the AMERICAN CARPENTER AND BUILDER. He is at last persuaded that perhaps there may be something in a circulation of 30,000. Note the change as he takes off his coat and proceeds to open his morning's mail.

He Tries the American Carpenter and Builder

Then we have the man who tries a small advertisement. He is pleased with the way it looks in our magazine, because even a small space can be made attractive when it is nicely printed. A little later, encouraged by the results, he ventures to use a page. See how much more pleased he is. He will be even more so when he discovers how many more of our subscribers "sit up and take notice" when they see his striking announcement, and send in their orders.

Last we depict the man who is doing a small business, or no business at all. He doesn't advertise beeause "advertising costs too much." He refuses to believe that there is another side to the argument. Yet the other picture shows another man's view—and it is the view of the man, too, who speaks from experience,—"It's worth all it costs."

These are not exaggerated examples—not at all. And our readers are doing their share (by their co-operation in buying of advertisers) in convincing them that advertising really does pay—and pay big. We appreciate your assistance, friends, and assure you that we give you full credit for the great part you have played in this good work, and we will endeavor to repay you by giving you a better and more practical magazine every month. Keep it up.



"Advertising is Worth all it Costs"

J.A.F.Cardiff.

Building a Home

A SERIES OF ILLUSTRATED ARTICLES COVERING CONSTRUCTION DETAILS IN THE ERECTION OF OUR AMERICAN HOMES—FROM THE LAYING OF THE FOUNDATION TO THE DELIVERY OF THE HOUSE TO THE PAINTER

PLATE 33, illustrates windows in both frame and brick walls with inside blinds projecting in the room and folding back flat against wall.

Fig. 142 illustrates the window in the frame wall. This wall is constructed of two-inch by five-inch studs set 16 inches on centers. Studs are doubled about window and door openings and are doubled for the head and sill of each window and the head of each door. One row of herringbone crossbridging is provided between the studs for each story.

The outside of the framework is covered with 1-inch by 8-inch matched or ship-lapped hemlock or North Carolina boards. These boards should be laid diagonally in preference to horizontally as they make a more rigid wall when so laid.

This sheating is covered with a heavy tarred or rosin sized building paper, well lapped at all joints and well turned in at all corners and angles.

The exposed covering of the exterior of the wall consists of shingles laid five inches to the weather with broken joints and of random widths. Shingles over six inches wide should be split. Shingles should be well nailed with two galvanized nails to each one.

The inside of the wall is plastered on wooden lath and grounds are nailed to the studs to form a gauge for plastering and to give a nailing for the trim. The strip on which the studs are hung should be of the same material and finish as the adjoining trim. The inside stop head also serves the purpose of a blind stop.

The blinds are hung on a special hinge as shown, which permits them to be folded back against the wall, clear of the trim.

This manner of folding the blinds is not quite so good as the methods given in previous numbers as the blinds are rather unsightly and are great dust catchers. This method, however, is resorted to quite frequently owing to lack of space for a blind box.

The window frame is known as a box frame and the space between the box and the stud is either filled with 'scratch' mortar or calked with oakum, so as to make it wind proof.

Fig. 143 shows the same construction adapted to a masonry wall. The window frame is set so as to give an eight-inch reveal. The masonry jamb is rebated for the frame and the joint of the frame with brickwork is covered with a moulded staff bead.

The construction of the heads and sills is about the same as in previous window frame illustrations.

The wall is of brick, thirteen inches thick and the opening is spanned on top by a stone lintel or a brick face arch, back of which is turned rowlock relieving arch over a wood lintel or center.

The sill is of stone cut with a wash and has raised lugs or stools to receive the brick impost or jamb. The sill is usually two brick corners in height, eight inches longer than the width of the brick window opening, and is of a proper depth to extend under the wood sill at least two inches. The projecting portion of sill has a water nose or drip cut on the underside. The sill when first set should have mortar placed only under the ends which receive the brick imposts. The portion of the sill spanning the opening should be kept free from mortar until the building is topped out, as the settlement, which inevitably occurs, would be likely to crack the sill if bedded in mortar under the center. The open joint however should be well pointed up after the settlement has taken place.

✣

To Upbuild Georgia

At the annual meeting next week of the Georgia Industrial Association, largely representative of the cotton-mill interests of the state, special attention will be given to the question of immigration and addresses will be made by men thoroughly acquainted with the subject and of practical experience in the field. For several years efforts have been made to establish in Georgia a state bureau of immigration. Public sentiment in favor of it seems to be at present stronger than ever before, and it is hoped that the gathering next week may crystallize the sentiment so effectively as to induce positive action by the next legislature.

✣

Corticite is the name of a new cork insulating material invented by a Portuguese firm. It is said to resist alike the cold of a Siberian winter and the heat of a tropical summer, and it not attacked by insects, even by the white ant. When made into bricks and slabs it can be sawed like wood and will not take fire.

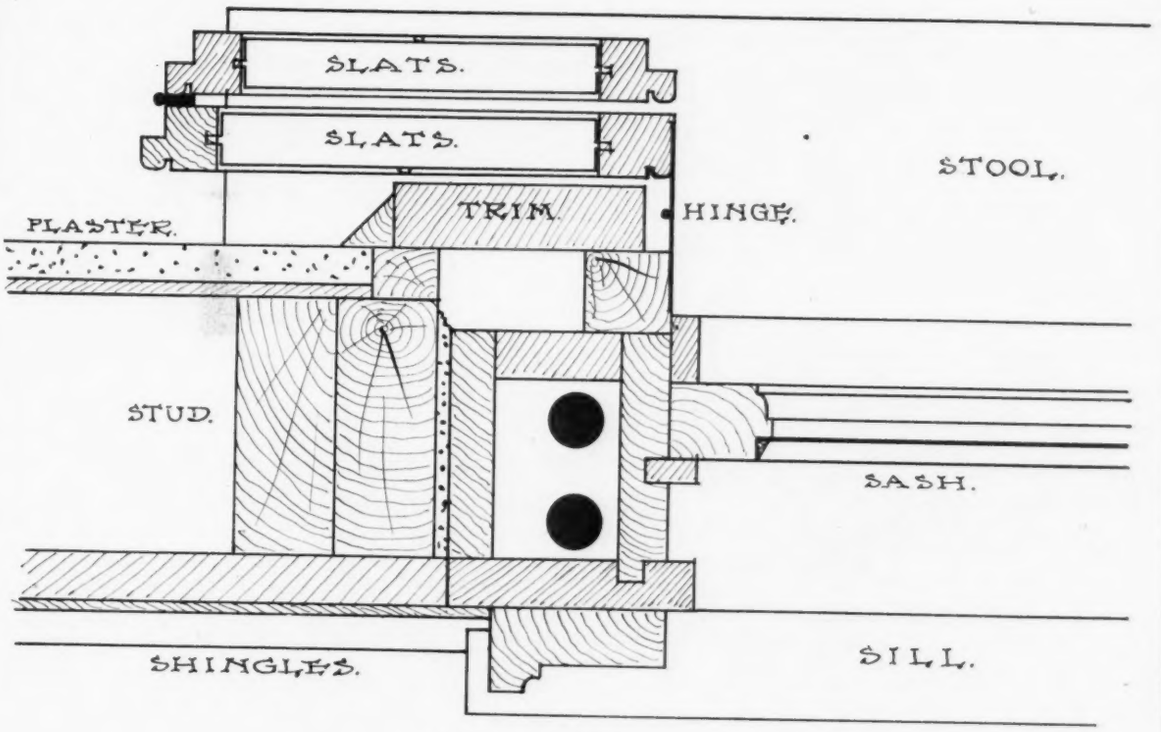


FIG. 142.

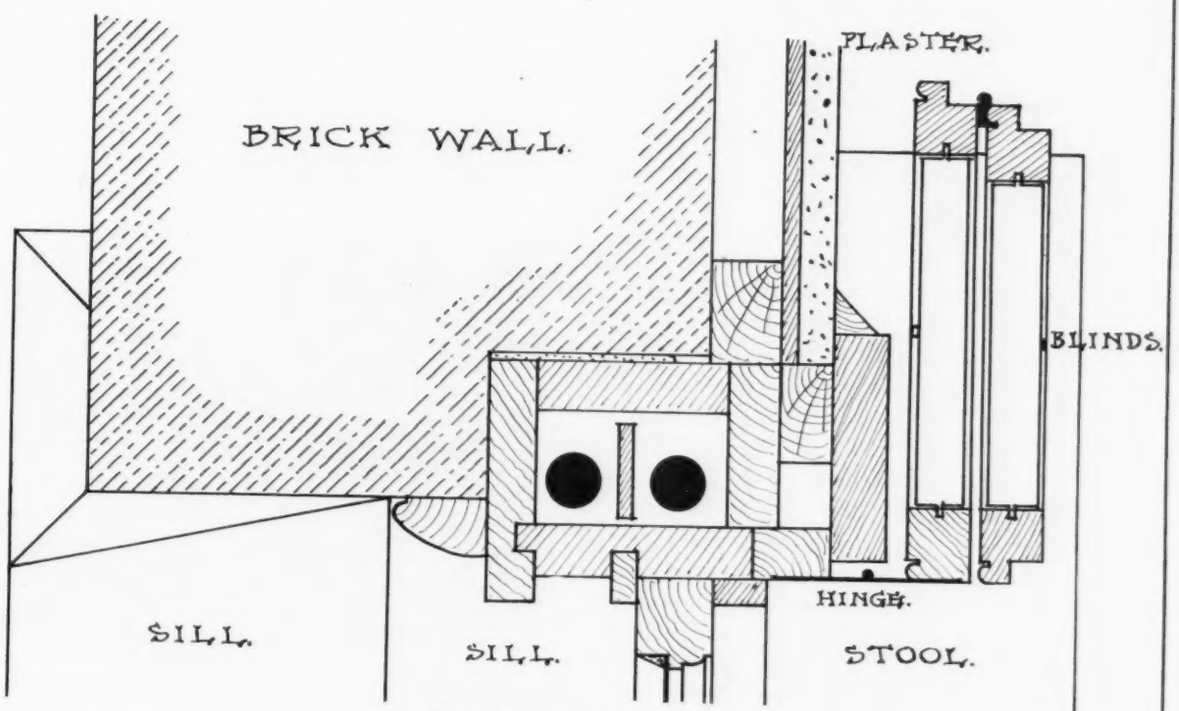


FIG. 143.

PLATE XXXIII.

WINDOWS.

Building a Home

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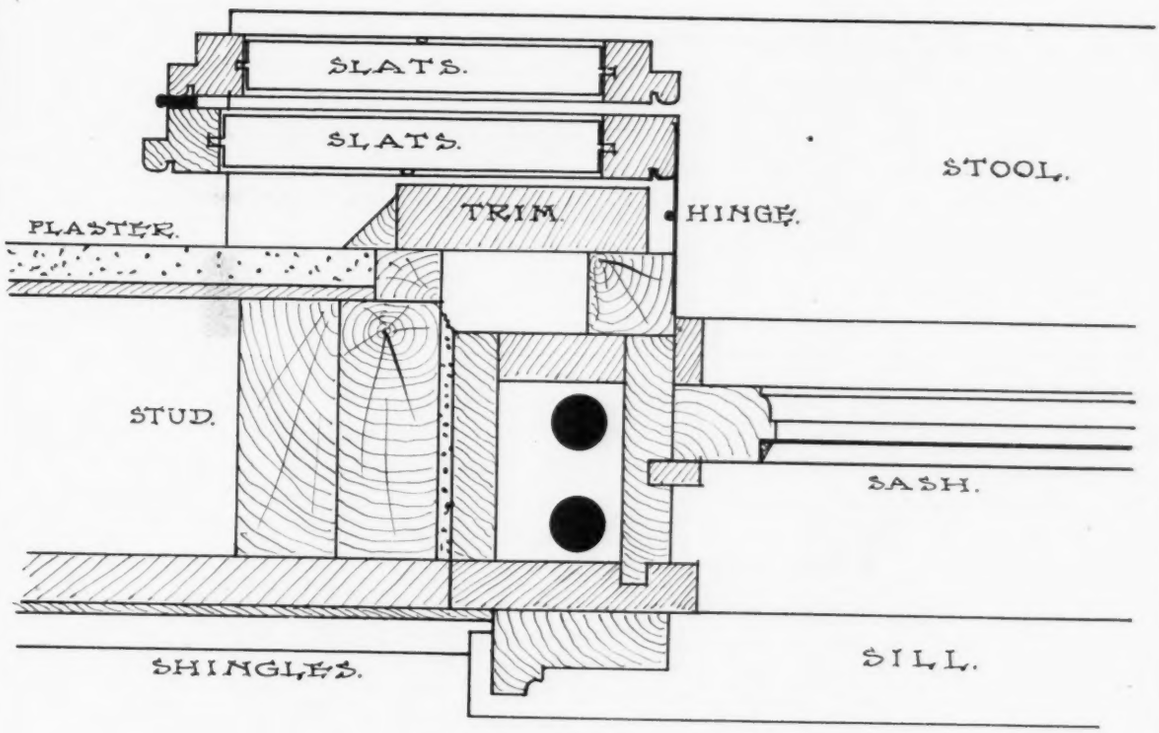


FIG. 142.

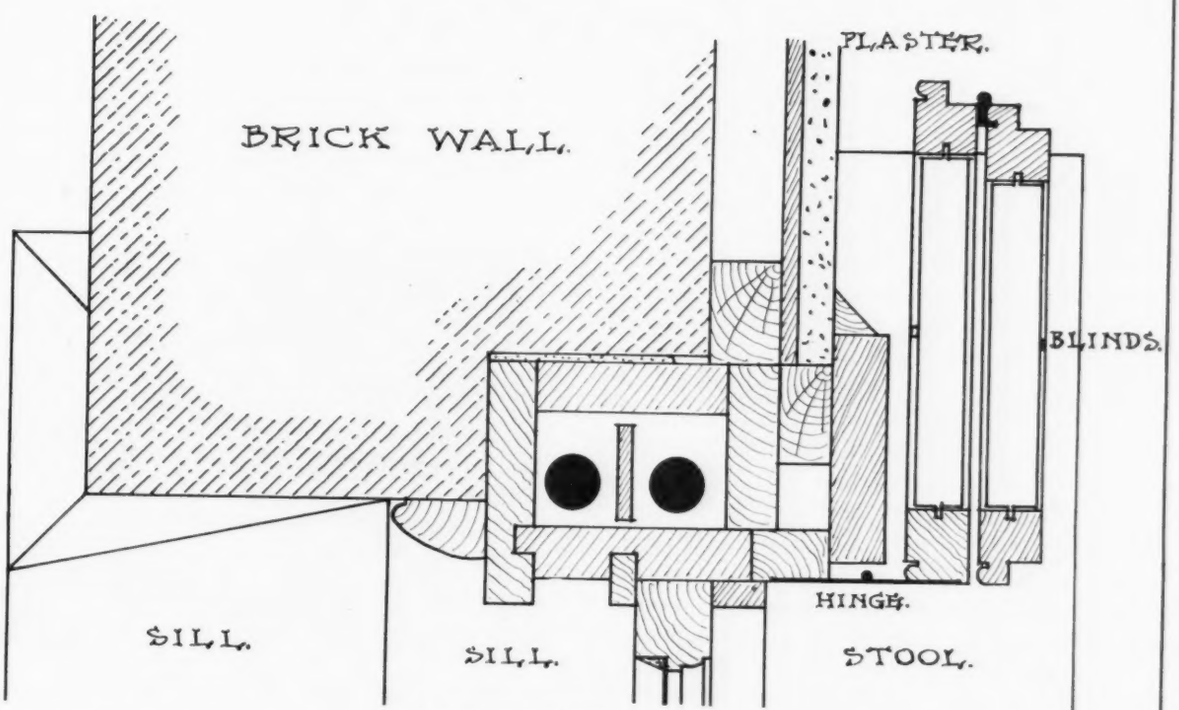


FIG. 143.

PLATE XXXIII.

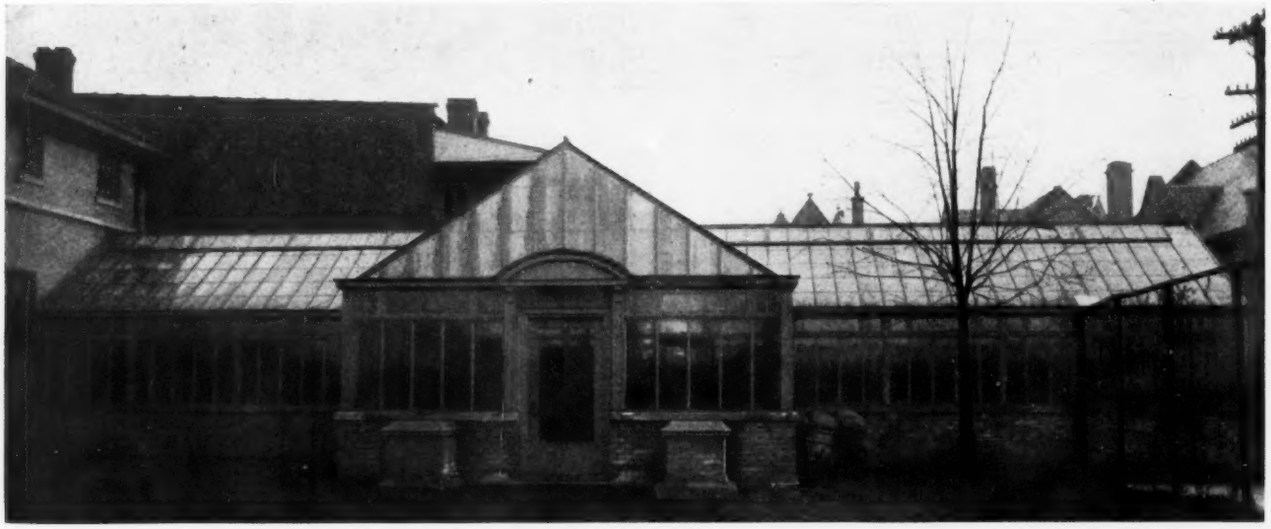
WINDOWS.

Modern Greenhouse Construction

INCREASING POPULARITY OF GREENHOUSES AND THE METHOD OF CONSTRUCTING THEM—ARRANGEMENT AND KINDS OF MATERIAL TO USE

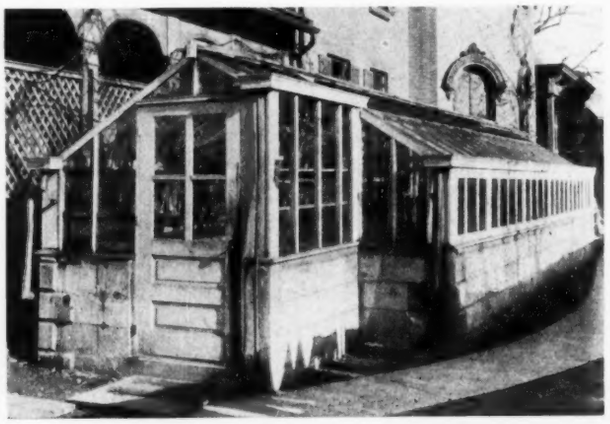
By George E. Walsh

THE popularity of greenhouses, conservatories and cold-frame plants for the cultivation of plants the year round makes their designing and construction of vital importance to carpenters in both town and country. The greenhouse has reached a stage of development where it is no longer an experiment, but a commercial plant or factory built along exact lines from which certain given results can be obtained. Its lay-out and construction should be just as exact as that of any other building, and to give entire satisfaction it is necessary that every part of it conform to rules which experience has demonstrated as the best.



In the treatment of a plant factory of this nature it is necessary to consider the greenhouse, conservatory and cold-frames separately, while to a certain extent covering the same needs and requirements of growers of plants and flowers, they are totally different in their size, design, method of construction, ventilation and heating. The greenhouse whether for amateurs or professionals is the most important for it is built on a more ambitious scale and assumes to cover more ground and accomplish greater things. Greenhouses for amateurs are becoming the most popular accessories to country homes. In the past the owner of a greenhouse was considered a fortunate individual, and only the man of wealth or a commercial florist could own one. They were considered too expensive luxuries for the ordinary owner of a country place. But to-day all sizes and styles of greenhouses are being built, and few suburban or country places are too small not to have space enough for an amateur greenhouse. Moreover, the amateur greenhouses pay, that is they pay more than good interest on the money invested in the abundance of flowers and vegetables raised.

Greenhouses may be built all the way from $500 up to any amount desired. A lean-to greenhouse, 20 by 10 feet, complete with beds, ventilating apparatus and heating plant, can be put up for $500 in any section of the country, while in regions where lumber and labor are cheap the cost may be reduced to $400 and even $300. In such a simple, inexpensive house sufficient plants can be kept through the winter for the ordinary household. There is a general plant room for flowers and vegetables, a seedling section, a special room for raising some choice flowers such as violets, a work room, and the heating plant. The conservatory is usually an adjunct to the house, with an inside entrance, cold frames and hot beds are places where the

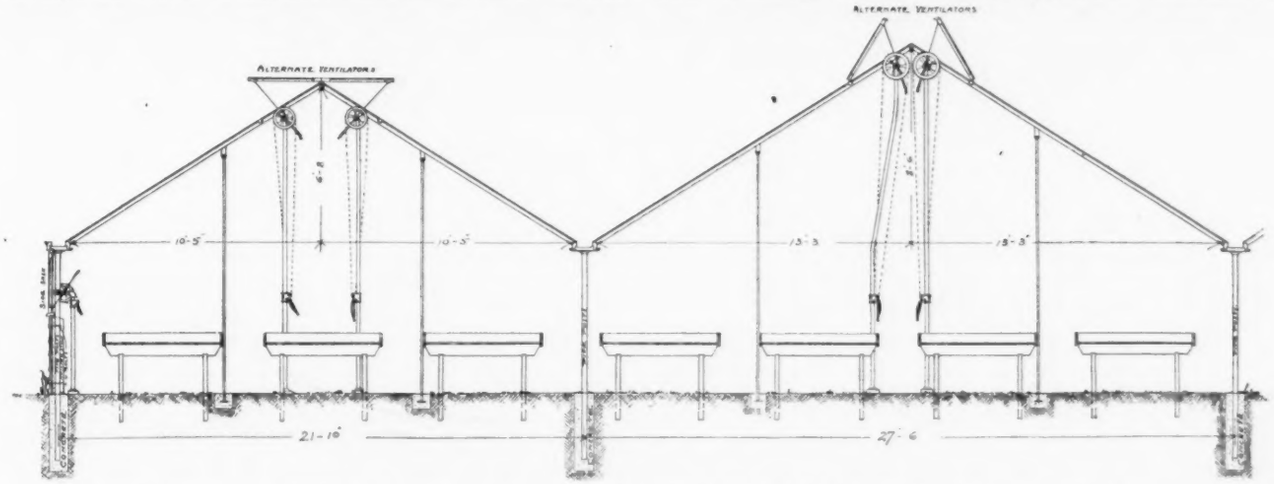


heat is obtained entirely from the sun and the fermentation of the manure; but greenhouses proper are independent outside structures which have their own apparatus. Where a lean-to is built on one side of the house, the heating may be derived from the house system of steam or hot water by means of a set of

pipes and coils run through the sides of the house. Such a greenhouse has many economical advantages, both in construction and heating.

If a lean-to greenhouse is built it should face toward the south, with the house forming the wall on the north side. The slope of the lean-to should average about one foot in twenty. The foundation walls

should be made of brick, stone, cement blocks or other masonry. The walls should be carried at least two feet below the surface level, and should extend two or more feet above. If masonry walls are not desired, the wooden or iron frame of the house should begin on a concrete footing. Good cypress free from sap makes an excellent wood for this purpose. The measurements of the sills, plates, ridges, gutters and sash bars should be made in advance and cut to rule. When



thus cut the frame is erected and fitted as in ordinary houses.

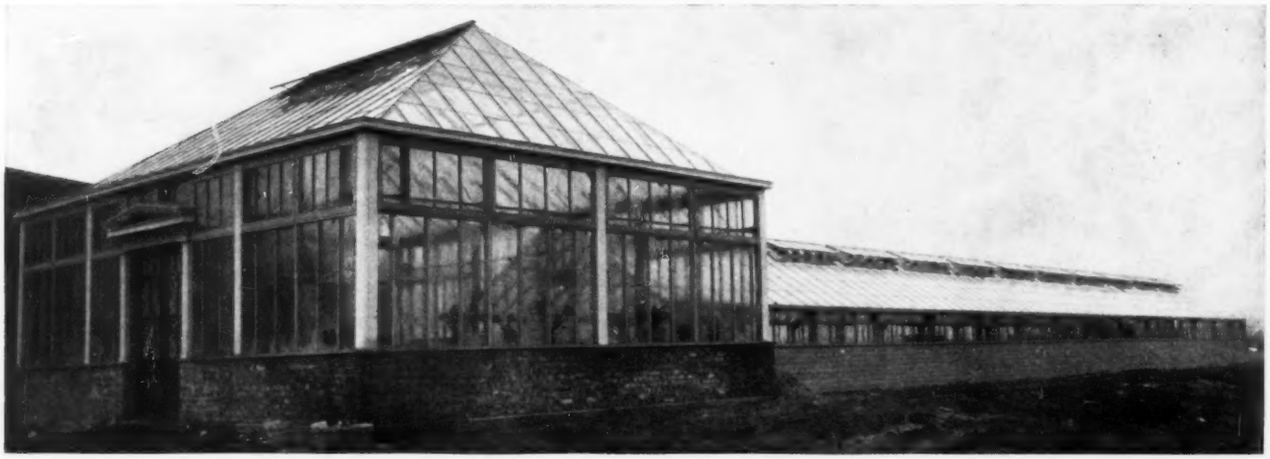
The interior of the greenhouse should be divided by light partitions so that the temperature of each room can be kept at any desired point independent of all the rest of the house. Simple, hot water heating apparatuses cost as low as $62, so that a temperature of 50 to 60 degrees can be maintained in a house with 1,000 square feet of glass surface during zero weather. The piping of such a plant includes 250 to 400 linear feet of cast iron or wrought iron pipes. The total height of such a heating plant is less than 34 inches, diameter 20 inches, and diameter of fire pot 15 inches. The supply and return pipes are two inches in diameter. These specifications are for hard coal, but when soft coal is to be used a larger size boiler should be used. The size of boilers and heating apparatus is generally rated by the amount of glass surface for different temperatures. A boiler plant suitable for 750 square feet of glass surface where the temperature is to be kept at 55 to 60 degrees in zero weather can be used in a house with 1,160 square feet of glass surface if a temperature is needed of only 40 to 45 degrees. With five pounds of steam at the boiler a temperature of 150 degrees in the pipes for water is maintained.

Much depends upon the construction of the house and the design of the heating apparatus in securing satisfaction with any greenhouse. If it is not a lean-to, but an independent greenhouse with no protection on the north side by other buildings, it is essential that the north side of the building should be amply protected by thick walls and the heating apparatus located on this side. The best and simplest practice is to build the north wall of masonry or double wooden siding to a height of five or six feet, with the glass sash above. The double wall can be made wind-tight, and with the boiler room on this end the difficulty of keeping up a high temperature is easily solved.

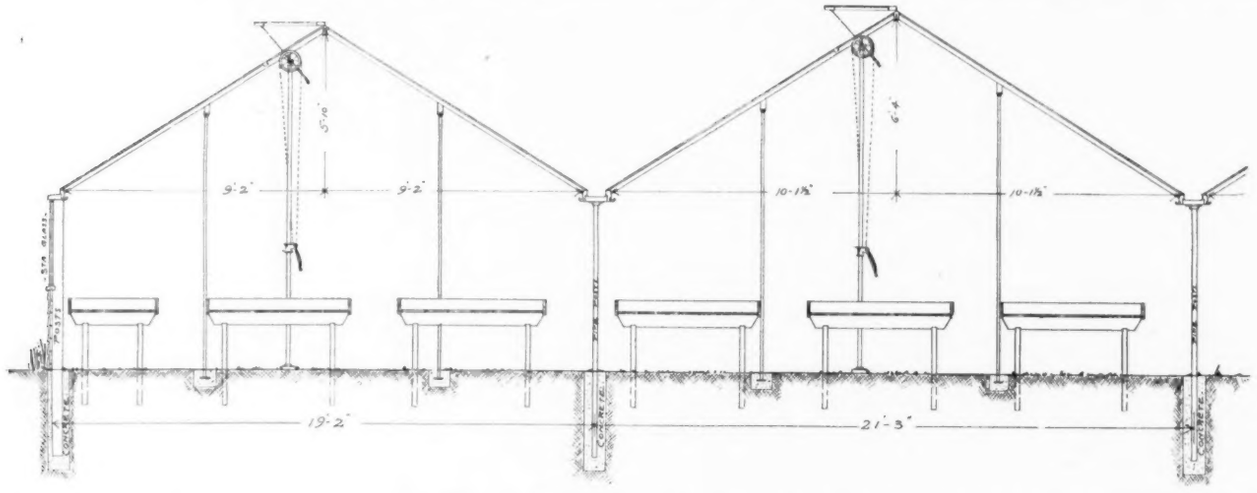
The glazing of the roof and sides of the greenhouse should be made of clear glass of double strength and about sixteen inches wide. It should be set with lapped joints, bedded in best putty, and secured with zinc or brass nails so that no danger can be experienced from falling out. The glazing of the house is a most important item in the whole work, for the weight of snow and rain may injure the sloping surface very easily. The slope is sufficient to permit rain and melting snow to run off easily, but on very cold nights ice may form on the roof and add a considerable load to it. The breaking of a roof of a greenhouse in winter means something more than the loss of the material and the cost of repairs. Hundreds of dollars worth of fruit and vegetable plants may be ruined by the cold and a whole season's work lost.

The ventilation of the greenhouse is as important as the heating. Unless proper change of air is obtained throughout the day the plants cannot do well. In winter time the problem of proper ventilation without injury to the plants is somewhat difficult. A continuous sash ventilator should be constructed. The ventilators should be hinged to the ridge and opened by means of arms or gear handles within easy reach from the interior. In large greenhouses additional ventilators along the sides and eaves are sometimes supplied.

A 20 by 10-foot greenhouse, costing $500 or less, should have a height at the ridge of 8 and a half feet, with every partition adding a little extra to the cost. In such a greenhouse no masonry work is actually required other than that needed for setting the boiler and heater. A wooden base setting can even take the place of this for a foundation, but owing to the noncombustible nature of the bricks a masonry setting is preferable. The greenhouse should be divided into at least two sections, the larger for the plant tables and walk, and the smaller for the heater and a convenient bench for working.

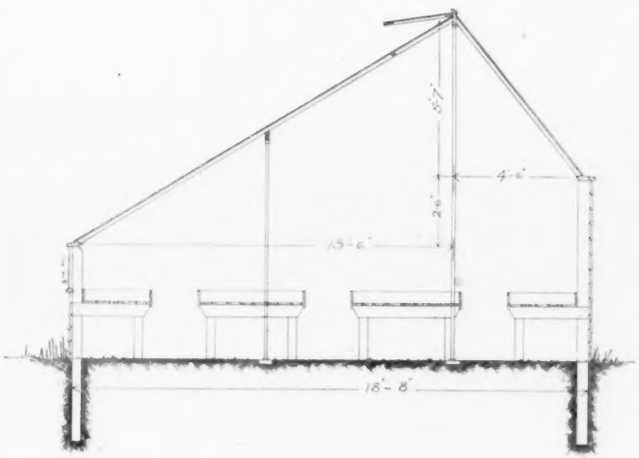


A three-quarter span greenhouse, 12 by 25 feet in width and length, built against a north wall or other structure at least eight feet high, is a cheaper type than the former, and it can be put up complete, with sash, ventilator and heater, at a trifle under $400. The front of the house is about five feet high, and consists of two feet and six inches of foundation wall and two feet and six inches of glass work. This type of house is particularly suitable for locations running east and west, and where the proper site can be secured it gives the greatest amount of satisfaction for the money invested. While it may be used for the same general purpose as the full span house, it has many special advantages of its own in mid-winter for forcing. A forc-



ing room can be kept at a very high temperature on the north side at a minimum expenditure of fuel.

A small lean-to greenhouse located in a favorable angle of a house, barn, corner wall or other protection is the cheapest form of structure that can be erected. In such a type two sides of the greenhouse are formed by the wall or building already in existence. It follows then that only the other two sides and the roof need building. A greenhouse of this character, 20 by 10 feet can be put up complete at an expense of $250 to $300. The height at the ridge is about nine feet.

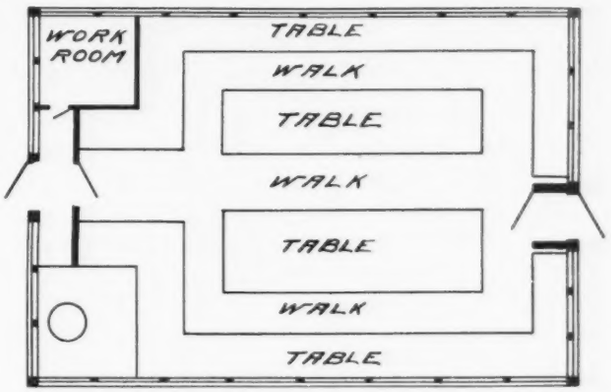


and the front five feet, including a two and a half foot foundation wall. The foundations are shingled on the outside, and if built of wood the wall should be double with an air space between. The old method of filling the space between the walls with saw-dust is not considered necessary to-day. Air is as good a non-conductor of heat and cold as saw-dust. All that is essential is that the two walls be built with good lumber well matched, and builder's paper attached to either side. If the corners are snugly fitted there is little chance of wind or snow filtering through. Frequently a single door is used for such a house, but it is always more satisfactory to have double doors, one opening inside and the other outside. This insures dry air and warm temperature inside. On very cold days the frequent opening of the door tends to chill the plants placed near the entrance. A temporary vestibule built outside and taken down in spring saves fuel and protects the plants from any danger. Such a vestibule can be constructed in sections so that it can be removed and stored away through the summer, and beyond an occasional painting it requires no further care.

The commercial greenhouse built on a more substantial plan requires more planning and designing. One would hardly think of putting up a commercial greenhouse of less than thirty or forty feet in length and fifteen to twenty feet in width. This size house, and the larger ones of fifty to sixty feet in length, necessitates a wide span which increases the problem of construction. With a greenhouse twenty feet wide, the distance from the center to the sides is ten feet, and from the roof ridge to the eaves makes a formidable span. The weight of the glass on this span is considerable. Most houses of this size are constructed with purlins to support the roof.

Commercial greenhouses are built in a great variety of ways and of many different materials. Portable wood or iron greenhouses are now manufactured so that they can be shipped direct from the factory and assembled on the spot by the contractor. In such houses exact measurements of design are prepared in advance, and all parts of the house except the masonry work is prepared. It is better in such cases, however, to draw the plans for the work, and then after assembling it on the spot to glaze the sash and roof with local supplies and finish off walls, doors and interior fittings as needed.

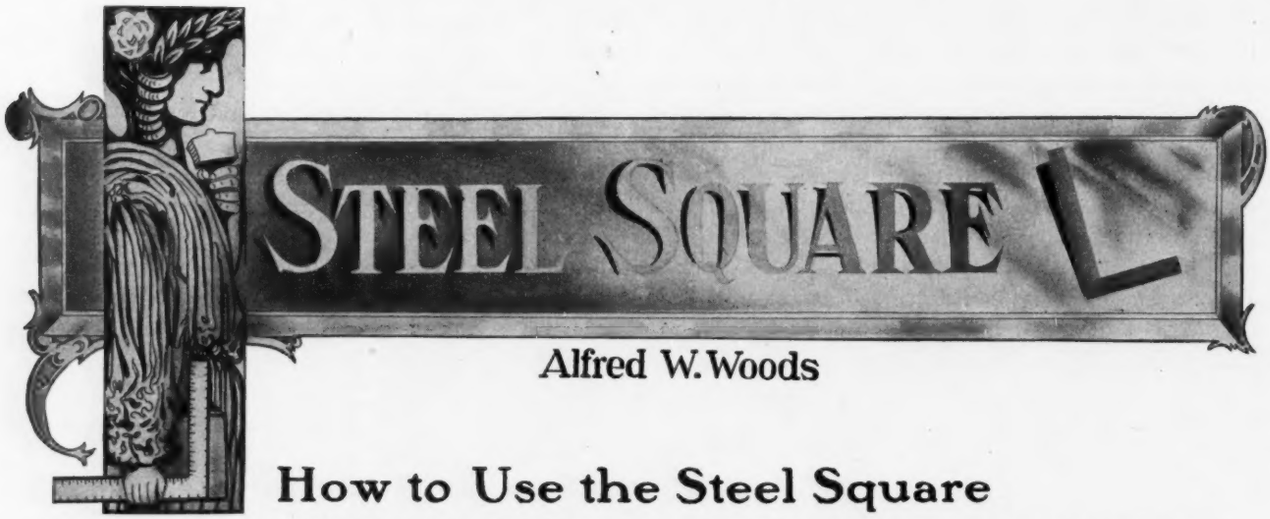
The use of cement and concrete blocks for greenhouse walls and floors is growing in many sections. Hollow concrete blocks make an excellent foundation and wall for amateur or commercial greenhouses of any size. The first course of blocks is laid a foot or two below the grade and carried up five or six feet in the north side and two or three feet on the other three sides. The walls are proof against changes in temperature, and the air space between prevents much dampness from soaking through. A concrete walk in-



side, with proper slope to the sides to carry off moisture gives a permanent finish to the place.

Down the center of the greenhouse a table of wood should run, and on either side similar tables should be constructed. A walk should be left between the tables all around the building, so that any plant can be easily reached. This walk is made of concrete, and the spaces under the tables left without any flooring. Any moisture from the watering of the plants will then run off and be absorbed by the soil. The heating coils and pipes must run under the tables and benches down the middle and on either side so that under or bottom heat can be supplied.

Greenhouse construction has become to a certain extent a specialty, but there is nothing in it that cannot be picked up and executed by the ordinary carpenter. Material can be bought, cut, fitted and prepared with plans and diagrams for its erection, which give the best of satisfaction and can be put together by an ordinary mechanic.



Alfred W. Woods

How to Use the Steel Square

SHOWING A READY RECKONING TABLE FOR FINDING THE FRACTIONAL LENGTHS OF RAFTERS, DEVELOPING THE LENGTHS AND CUTS FROM THE TRIANGLE AS APPLIED TO THE STEEL SQUARE

TAKING up the subject where we left off in the last number, we will refer to our last illustration showing the table at Fig. 87 in the convenience of same for finding the lengths of rafters for odd runs, such as feet, inches and fractions of an inch in the run, as the figures stand for either feet, inches or fractions of an inch. The fractions, being expressed in the same denominations (twelfths), permits of a

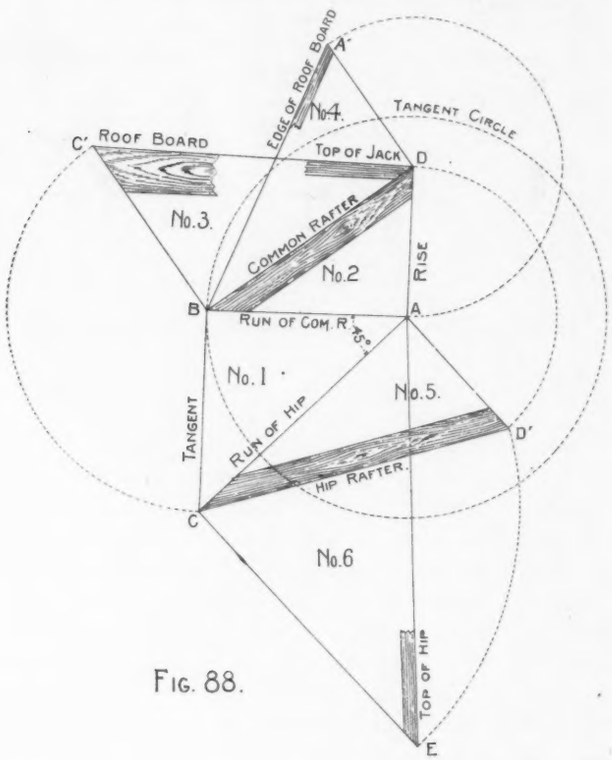


FIG. 88.

sliding scale as follows; for an example, suppose the run is six feet and one-half inches with a one-third pitch. In the intersecting square opposite the rise and run, we find seven feet two and six-twelfths which answers for the six feet. For the six inches in the run, read the above figures as so many inches and twelfths of an inch, and for the half inch, read the above figures again as so many twelfths and fractions of a twelfth of an inch. The whole may be expressed thus:

For the six feet	.....7 feet 2 and 6-12 inches		
For the six inches	.....7 and 2-12 inches		
For the six-twelfths	.....7-12 inches	2	6
Answer	.....7 feet 10 and 3-12 inches	8	6

Then 7 feet 10 3-12 inches is the correct length. The last two figures (8 and 6) are dropped because they represent too small a denomination to be retained. Remember these figures represent twelfths (not tenths) and we only carry to the next column when the sum exceeds twelve, otherwise the operation is just the same as in simple addition. If the run was, say 5 feet 7 and 9-12 of an inch, the figures would be expressed thus:

For the 5 feet	.....6 feet and 1-12th inches		
For the 7 inches	.....8 and 4-12 inches	11	
For the 9-12 inch	.....10-12 inches	9	10
Answer	.....6 feet 9 and 4-12th inches	8	10

Then 6 feet 9 and 4-12 inches would be the correct length of the common rafter. This may seem like getting the lengths and cuts down to a small point. So it is. To many it may seem useless. In this, we have been accused of splitting hairs but we would rather see split hairs than to see rafters wedged up with a "dutchman" and with gaping joints at the bearings, for what is the use of using good material and leave yawning joints with the bearings oftentimes at the tip ends of the rafters where the wood is thin and this cut to pieces with nails in the vain effort to make it "good enough?" If we make poor joints why not use poor lumber? Sorry to say we are forced sometimes to use poor lumber, but there is no occasion for poor joints. Make the cuts to get the full bearings and thus save all

the strength there is in the material in bracing power. This table refers only to the rise and length of the common rafter. It could be so enlarged as to include the corresponding octagon hip and common hip or valley, thus making a very handy table for ready reck-

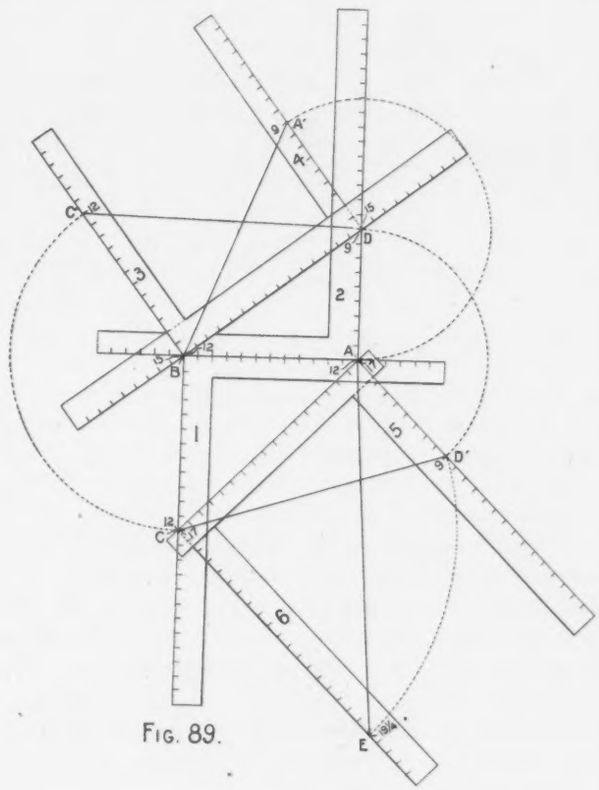


FIG. 89.

oning purposes. We have the data now ready and the preparation of such a chart under way, but we must pass on. In Fig. 88, we show how all of the lengths, cuts and bevels may be obtained from the triangle, bounded by A-B-C, formed by the runs of the common and hip rafters and the tangent, as shown at No. 1, as follows: From the run of the common rafter, erect the desired rise as at A-D and connect D-B. This forms the second triangle and contains the length, seat and plumb cuts of the common rafter, as shown in No. 2. At right angles from the common rafter draw a line equal to the tangent as B-C¹ and connect D-C¹. This forms the third triangle, as shown in No. 3. In this are shown the face cut of the roof boards to fit in the valley or over the hip. This angle also gives the cut across the back of the jack to fit against the hip or valley, commonly called side cut of the jack. At right angles from the common rafter draw a line equal to the rise as D-A¹ and connect B-A¹. This forms the fourth triangle, as shown in No. 4. In this is shown the edge or miter cut of the roof boards to fit in the valley or over the hip. In other words, this is the same as the miter for a hopper. Now then, we will work from the other side of triangle No. 1. From the run of the hip draw a line at right angles from A-C equal to the rise, as at A-D¹ and connect C-D¹. This forms triangle No. 5 and contains the length, seat and plumb cuts of the hip. From hip rafter and at right angles to A-C draw a line equal to C-D¹ as C-E and connect A-E. This forms triangle No. 6 and in it is contained the top or, commonly called, the side cut of the hip. This illustration is for the 3-8 pitch or 9 inches rise to one foot run of the common rafter. For an octagon roof the angle at No. 1 would be 22½ degrees. For a hexagon roof it would be at 30 degrees, and otherwise, proceed as in the above.

In Fig. 89 are shown all of the above angles formed by as many steel squares, with the corresponding numbers placed on same that help to form two of the sides of each angle, and, by refering to the preceding illustration, the reader can readily see how the cuts are obtained on the steel square. To make this point clear, we refer to Figs. 66, 67, 68, 69 and 71 in the June number, where these cuts are separately illustrated.

Optical Illusions

HOW THE BEST TRAINED EYE CAN BE DECEIVED—SEVERAL ILLUSTRATIONS THAT ARE COMMONLY USED TO SHOW THIS POINT

By A. W. Woods

WHILE the eyes are the most useful of all the parts of the human make up, they are to a certain extent liable to lead the thinking faculties astray in many things unless specially trained along certain lines. Even then they cannot be relied upon for accuracy in proportionate measurements, such as is used in the different parts of entablitures, tapering of the column, etc.

A carpenter once said when his attention was called to a piece of work that did not come up to the standard in proportion, "I have a mechanical eye and I know the work is all right." We said to him that he could not always depend on the eye, that it was liable to deceive and that it was best to take the proportions laid down by the old time artisans that had made the

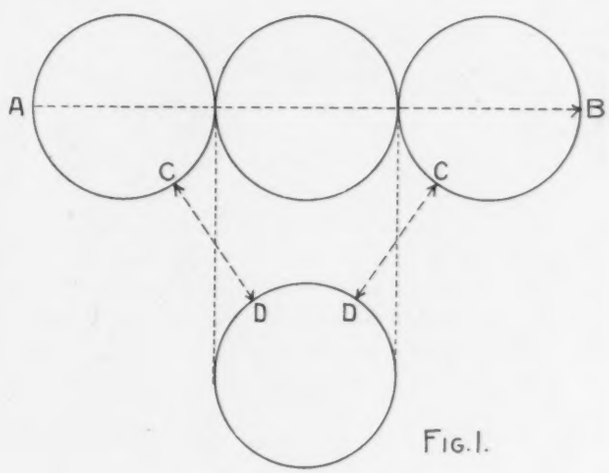


FIG. 1.

subject a special study, their works were models that had stood the test of time and upon which none have been able to set up a better standard of proportions. Yet he said he considered his eyes as good as any other man's and did not consider it worth while to rely on others for his information. To hold our end of the argument, we handed him a newspaper and asked him which end of the letter S was the larger. Without hesitation the answer came back, "Why, there is no difference." Then we turned the paper upside down and this is what he saw S. Here in this simple example was a proplem in proportion that his mechanical eye had not detected after having seen it for more than forty years in the very words that went to make up the sentences from which he gathered his storehouse of information, yet he had not detected it. Then we took three dimes and placed them in a row, as shown in Fig. 1, and asked him to move out the center one till the space C-D equaled the space over all, as at A-B. He did so, and to his astonishment, he was off nearly one-third of the space. There is a well defined proportion in measurements that requires careful study and with which the successful artisans are acquainted. The inexperienced eye becomes accustomed to certain forms and when taken out of that channel is deceived, as was this man.

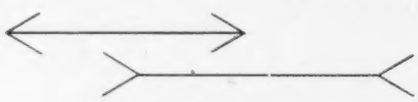


FIG. 2.

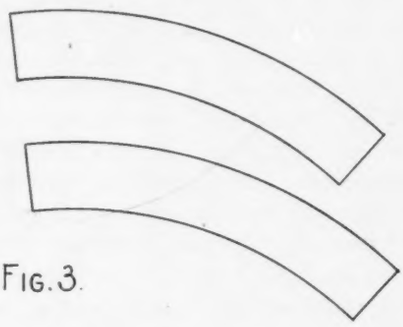


FIG. 3.

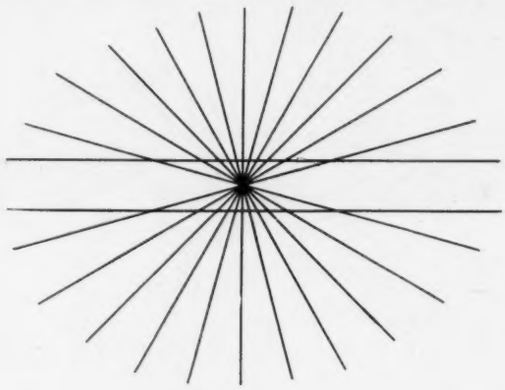


FIG. 4.

We will give a few other illustrations that are liable to deceive. In Fig. 2 are shown two parallel lines. If we were to ask which of the straight part of the lines was the longer, the answer would most likely be the lower one, of course; but by careful measuring, they will be found to be of the same length. If we were to ask which of the parts of Fig. 3 contained the larger area, the answer would most likely be the lower one;

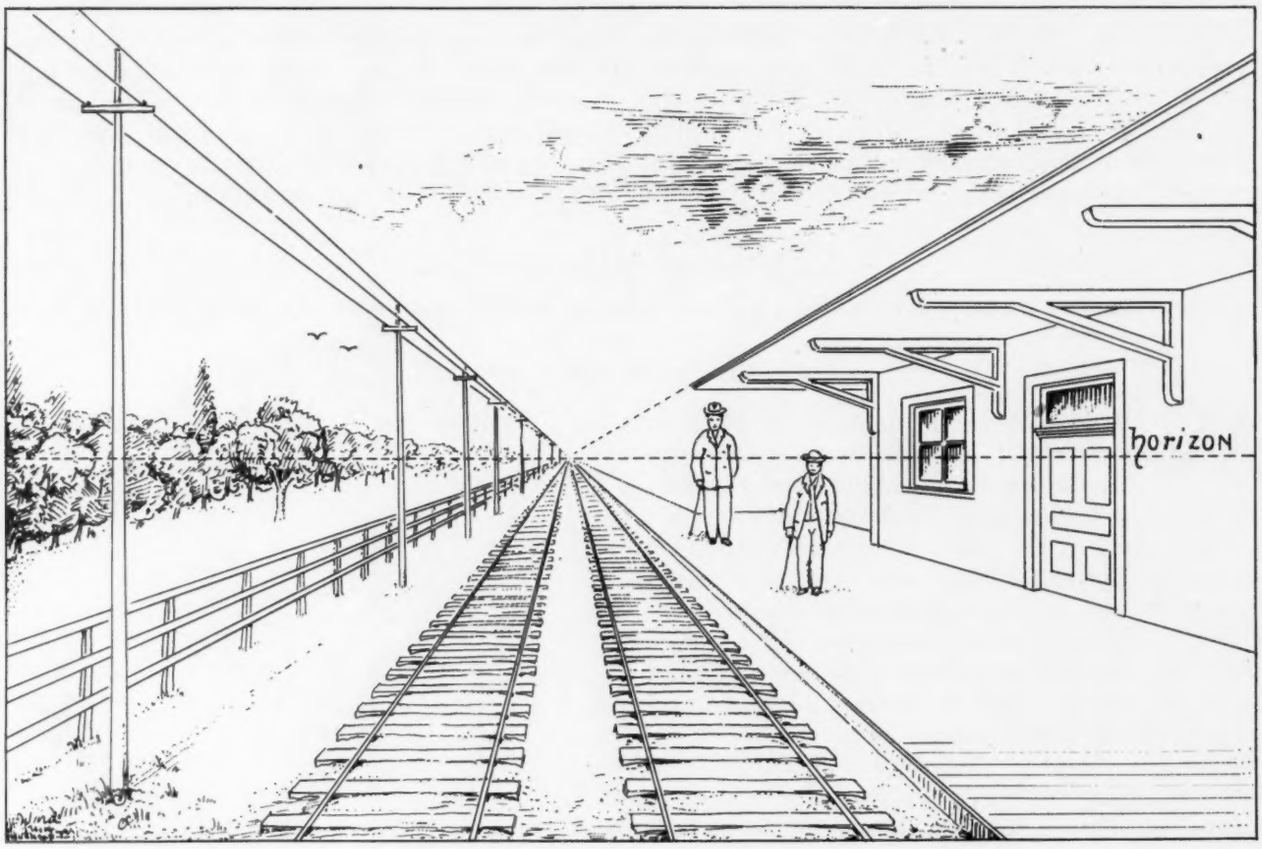


FIG. 5.

yet they are of the same size. Here is another one showing a lot of straight lines crossing at a common center, as shown in Fig. 4. Now there appears to be two gently curved lines drawn above and below the center, but they are not curved as will be seen by applying a straight edged rule to same. In Fig. 5 is shown a double railroad track with the station house on one side with an orchard field on the other. Now suppose you are standing in the center between the two tracks and looking down the straight run of the road, the rails and even the fences and telegraph poles seem to draw into a common center as they recede from us till away yonder at the horizon, they seem to almost come together. There is nothing strange about this, indeed, if it did not look so we would at once know that there was something wrong with our optics; but let us look in the foreground. Here are two men standing on the station platform. If we were to ask which of the two was the taller, the answer would more than likely be the one farthest down the platform, and yet, by measuring, they are found to be of the same height. The deceptive point in this is that the second man is not drawn in proportion to the surroundings. In other words, if the first man be six feet in height, then the second man, according to the picture, would be about nine feet tall. If they were of the same height then the horizontal line would pass through the hat of the second man, as in the case of the first man, because they are standing in line on a level plane and their heads should be in line with the vanishing point.

Making a Red Gum Desk

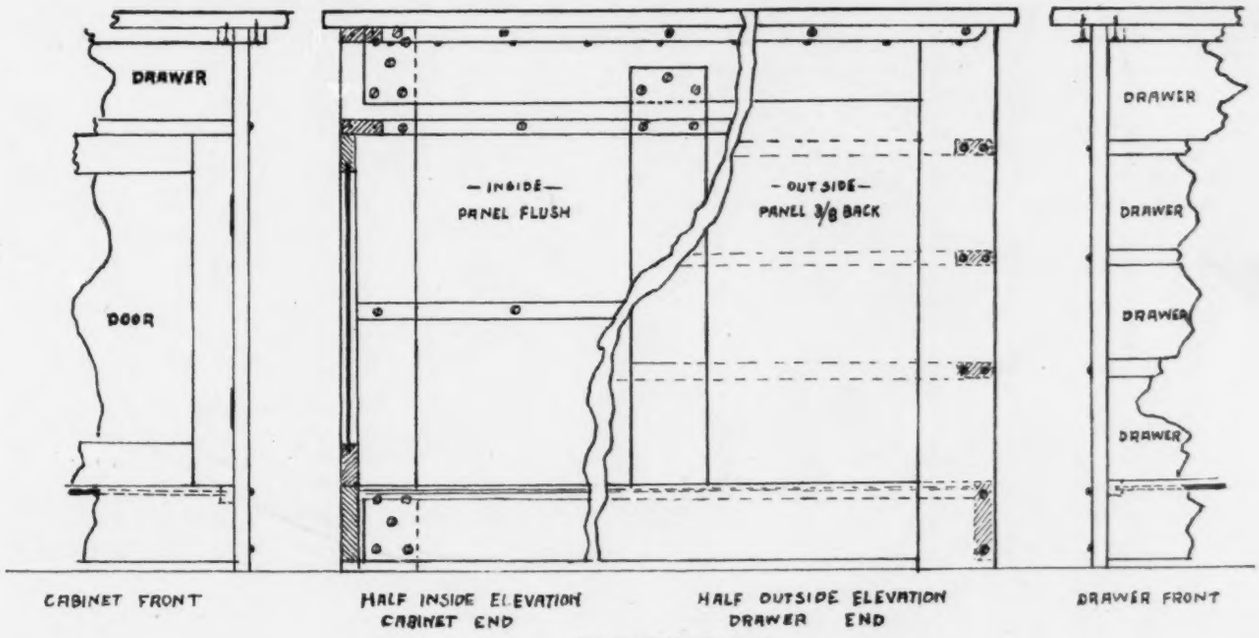
WHAT CAN REALLY BE ACCOMPLISHED WITH RED GUM IN MAKING FURNITURE—HOW TO PREVENT WARPING AND PROPER FINISH TO GIVE THE SURFACE

By J. Crow Taylor

I HAVE a red gum flat top desk made by myself of which I am rather proud, not merely because I made it, but largely from the fact that it stands as a demonstration of a point that I have been persistently advocating for some time, and that is, that red gum is an excellent wood for cabinet and furniture work, interior finish, etc. What impelled me to spend a lot of painstaking time in building by hand a piece of office furniture that I could have purchased for a small sum is a matter that might furnish a more or less interesting story in itself, but the thing more to the point right now is, how I built it and what it looks like since it is done, and I want to tell you it looks fine and convinces all who see it and are competent to judge that red gum has not been properly appreciated for its natural beauty and polishing qualities.

There is nothing complicated nor mysterious about the desk, nor the process of its manufacture. The original idea was to have a simple, plain desk embodying certain features of convenience, made double without getting the excessive width of the average double flat top desk. The size of the top is 36 by 60 inches, and it stands 2 feet 5 inches high. For the framing and all the material in the desk I went to a box factory using large quantities of red gum and asked them to select a few nice red boards, run them through the planer and cut them to the rough dimensions given.

To simplify the matter of dimensions, the frame was all made from 1 by 4 stock, as are also the two



END SECTION

drawers in the cabinet end that go above the doors. The main tiers of drawers are made of 5-inch stock, the panels are from 1 by 12-inch stock resawed, and the body of the drawers is made from inch stock resawed also with ¼-inch poplar for the drawer bottoms, and for the stationary cabinets with the exceptions of the ends, which are gum.

The main point I kept an eye out for was to so construct the work as to safeguard against the tendency of this wood to warp, for it is quite notorious for warping tendencies. The drawing will give a pretty good outline of how the work was done. Instead of mortising the frame together I halved it at the corners, fitting each frame carefully and boring for screws and then fastening the joints up with glue and screws. In fact, not only is the entire frame fastened together with screws, but the slide strips of the drawers are put on with screws and made to support the panels on the inside.

Instead of plowing the frames to receive the panels in the groove I rabbited them on the inside so that the panels would come flush on the inside and the slide strips which are ⅞ inch square crossing these panels served to hold them firmly in position and prevent warping.

One end of the desk contains a tier of four 5-inch drawers on each side and 4-inch base, while on the other end, which from outside appearances contains the regulation cabinet on each side, but inside it has peculiar features in that the stationary cabinets are removable. The doors for this are mortised together in the regulation way and have a 4-inch drawer over them as a receptacle for envelopes to match the stationery below.

The top is made of two pieces with a glue joint in the center and banded with a ⅞-inch strip with the outer edge slightly rounded, and the fronts of the frame are rounded to correspond. Also the handles to the drawers are made of the same wood, ⅞ by 1½ by 6 inches long, rounded at the corners to harmonize with the frame. There is no carving and no ornamentations, the only thing appearing on the outside with the exception of these rounded edges is the heads of screws, and they are quite plentiful, as the whole frame is put together with screws of the round head variety nickel plated. As the desk is not near as wide as the regulation double desk, the drawers, of course, are short, measuring just 15 inches in the clear in length and 12½ inches wide. This I find is plenty long, too, and a desk of this width and drawers of this length is so convenient that I have been wondering why furniture people do not make them this way.

There is not much detail to explain about the work of construction, as it was a simple matter of careful hand smoothing the stock, fitting it together and sanding it off. But, after the frame was together and it came to the matter of finishing there were some matters that it may be worth while going into detail about. For example, I did one thing that the furniture manufacturers and cabinet makers don't seem to have the habit of doing, and that was to thoroughly shellac all of the interior of the work. After the frame was put together, and before fitting the drawers in, I gave the inside of the top and the inside of the frame, handles and all, two coats of orange shellac, and then when the drawers were made and each carefully fitting in its place, they were given two coats of shellac on all parts except the front or face. What I did this for was to prevent the wood from absorbing moisture and warping, in other words, a protection to the wood. This is one thing that the makers of fine furniture might give attention to and spend a little time and money on to advantage, because I have found that while gum is considered the worst of woods to warp, swell and shrink, I have had no trouble whatever with this wood so treated, and the drawers slide as nicely as the day they were put in, and I know of a number of instances where expensive furniture has failed to behave that well.

So much for the inside. And now when it came to the problem of finishing the outside, I did a lot of thinking before I decided just what I wanted to try. I knew I wanted to show the natural color of the wood as near as possible. I did not want to stain with coloring matter, because the wood already had a beautiful brown tone with here and there a dark and light streak making a pleasing figure, and I wanted to see just how well that would show up under proper finishing. And what I finally did was this: I got some clear paste filler, gave it a coat of that, followed after immediately and rubbed it off well and then started in with orange shellac. I was a little afraid of it showing spotted, because of the difficulty of smoothing it down due to its quick drying qualities, and, as a safeguard on this point, I mixed it very thin, using probably twice as much wood alcohol as is commonly used in working shellac. I put on two coats of this thin shellac, which is equal to about one of ordinary consistency, and then when it was dry took "oo" sand paper and spent about three hours rubbing the surface of that desk. Next evening (for bear in mind all this work was done in the evening by lamplight, both the cabinet work and the finishing) two more coats of thin shellac followed and then the rubbing down with sandpaper was repeated, and the process was again repeated, making about six coats that were rubbed down, then came another coat of shellac, which was rubbed down with "oo" sandpaper, and after that the surface was carefully wiped off with a soft cloth, after which came powdered pumice, oil and rubbing galore. There was encouragement for this rubbing, though, for about this time the wood had begun to demonstrate its qualities for receiving polish and the finish came out nicely. It took quite a lot of patient rubbing, the whole time of shellac, and finishing taking the evenings of about two weeks. But, after it was done it

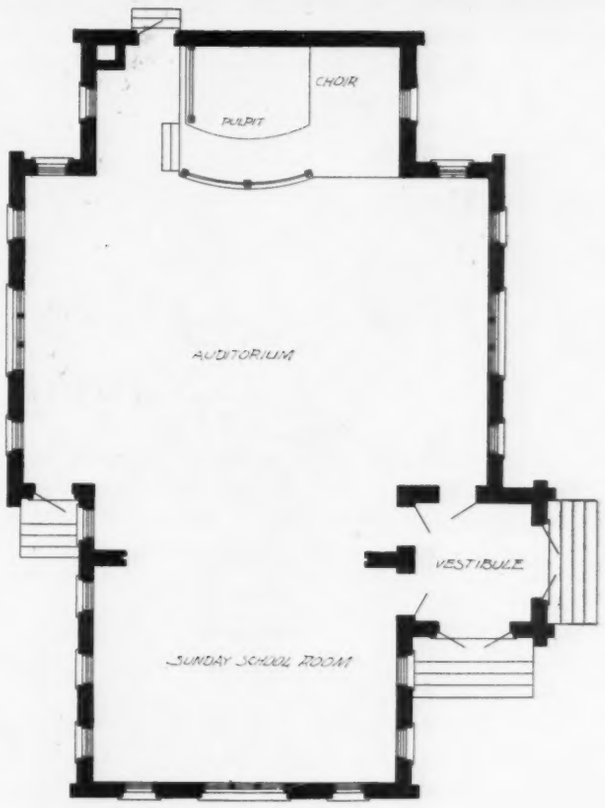
(*Continued on page* 816.)

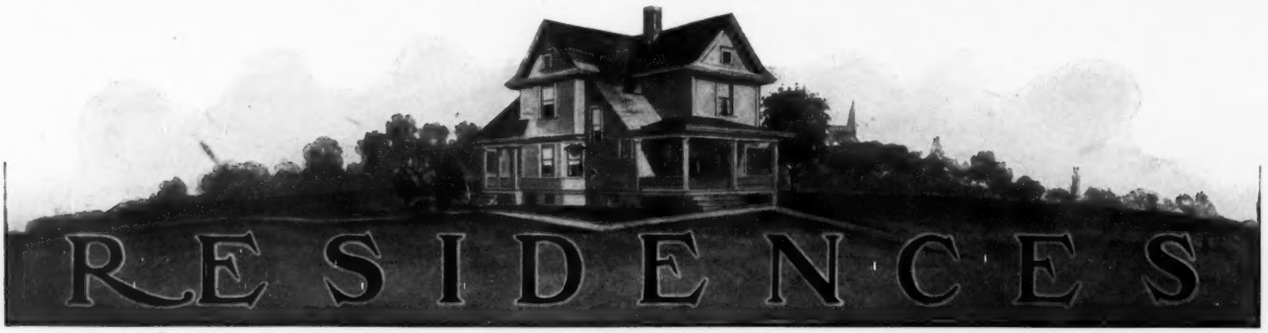
A Well-Built Church

PERSPECTIVE AND FLOOR PLAN TOGETHER WITH A CROSS SECTION SHOWING THE SLOPE OF FLOOR AND OTHER FEATURES

WE ARE this month illustrating a church which was built in Herrin, Ill., by G. W. Ashby, architect. The building is 45 feet 6 inches wide by 63 feet 6 inches long, with the main auditorium 40 feet by 42 feet, and the Sunday school room is 26 feet by 18 feet.

The church is built of red brick trimmed with buff Bedford limestone, making a very attractive building. There is a stone foundation under the entire church, and the basement floor is constructed of concrete, while the posts all rest upon concrete footings, which are 24 inches by 10 inches. The floor of the main auditorium slopes toward the pulpit. This is being done in all of the churches built at the present time, as it enables those in the rear to obtain a better view of the pulpit, and also enables them to hear better. Dividing the main auditorium from the Sunday school room is a rolling partition. This is operated by heavy weights, and it slides between the roof trusses. The windows are of Gothic design and add very materially to the appearance of the church. The building is heated by the means of a furnace, which together with the fuel and storage room is located in the basement. The distribution of the light which is often a perplexing problem has been well solved in this case.





Four Modern Houses

DIFFERENT STYLES OF HOUSES SHOWN AS SUGGESTIONS TO THE CARPENTERS AND ARCHITECTS—PERSPECTIVES AND FLOOR PLANS OF EACH SHOWN

SIX rooms and a bath room besides a good reception hall are shown on page 794. A house built like this offers a good deal of room in proportion to the amount of building material, and for this reason it is a very economical house to build. The more vertical pitch of the roof answers for both siding and water shed. The slope is not lost because the odd spaces are uses for clothes closets and the stairway. A roof of this kind may be built almost as easily as any other and it certainly offers considerable advantage in the way of extra room.

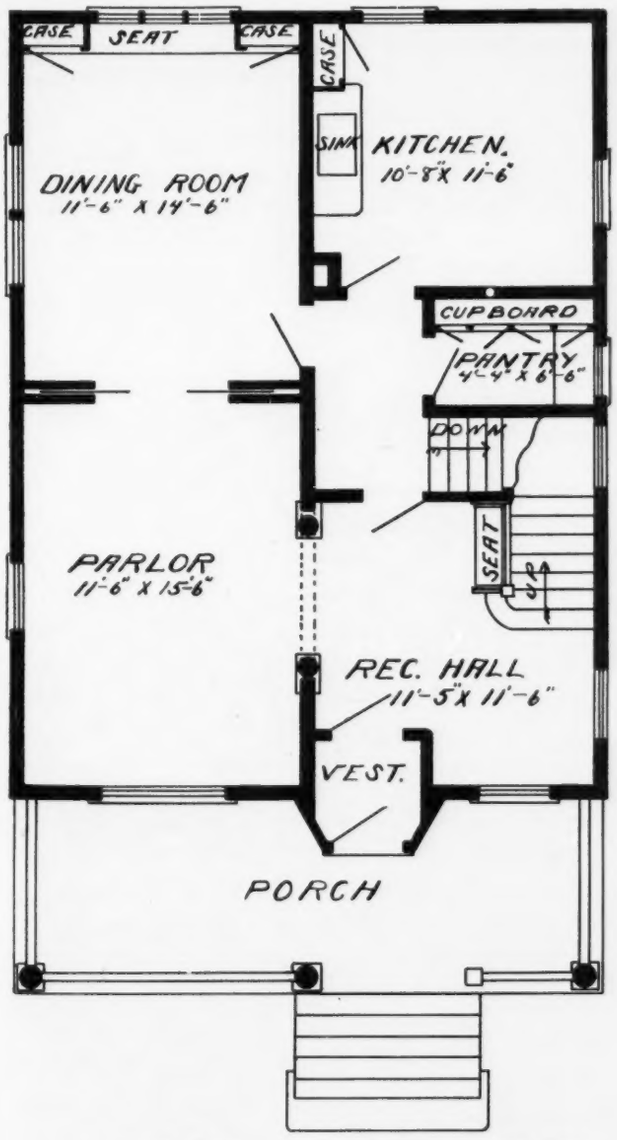
There is something about the size and proportion of the front porch of this house that helps materially in giving it a good appearance. A gambrel roof is not handsome naturally and a house encumbered with one needs some kind of embellishment. Architects sometimes fail in this one particular. It makes no difference how carefully a house may be planned if the proportions are not right the building is never satisfactory. Nobody likes a narrow minded veranda on any house and a narrow veranda here would make a fool of the whole thing.

The present fashion of leaving porches open underneath is open to serious question. If you do not build lattice work you have to pick up the brickbats and one costs about as much as the other, besides it is a great satisfaction to be able to leave a lot of rubbish where no one can see it.

A Gambrel Roofed House

The house shown on page 796 was designed by A. Raymond Ellis, Hartford, Conn., and he describes it as follows:

This is practically a country house, although not necessarily. The exterior of the first story and the gables and dormers are of cement plaster. The roof is covered with cedar shingles stained a soft green, the trim is a cream white and the blinds a green, producing a very harmonious effect.



FIRST FLOOR PLAN

The front entrance porch is made the central decorative feature. The side porch with the den at one end is something of a luxury and is planned in such a manner as to allow it to be built at a later date and not interfere with the design, that is if a saving on the first cost was necessary.

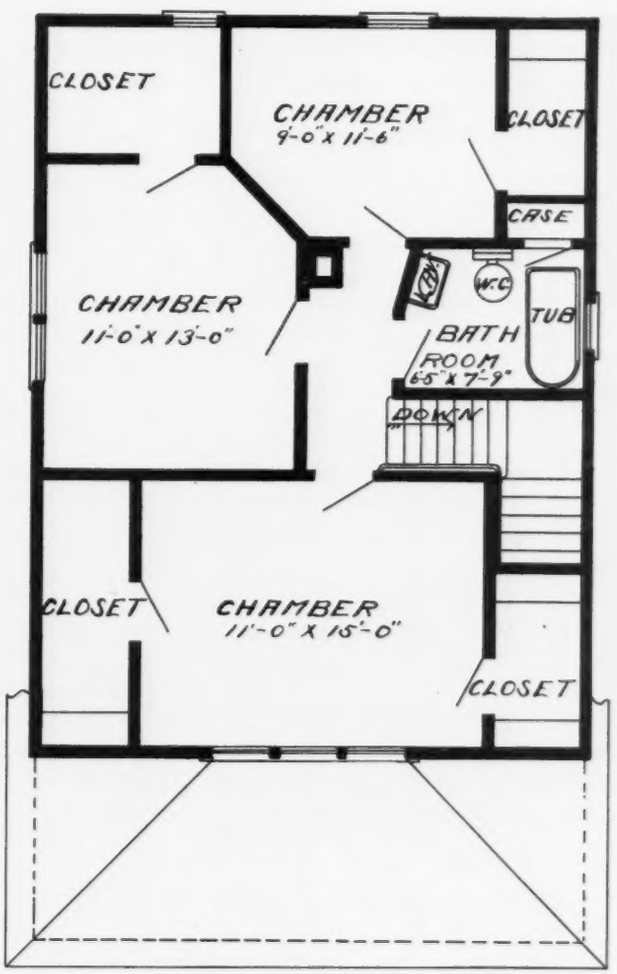
The interior arrangement is convenient and spacious. The dining-room, hall, living room and den are finished in cypress stained in dark colors, which brings out its beautiful grain, which is remarkable for its wearing and color in standing finish after being well joined and seasoned.

The floors throughout the main living portion are of narrow matched maple. The service portion is finished in white wood, trim stained natural, except kitchen, which has a North Carolina pine wainscot around it 3 feet 6 inches high. The floors are of rift North Carolina pine.

The dining-room and living room have fireplaces of red brick laid in designs with plain mantels, composed of pilasters and brackets.

The second floor contains four good bedrooms, a bath room and plenty of closet space. The attic contains the servants' quarters and storage room.

Cypress is used for the finish in the second floor hall, carrying out the scheme of the hall below, and the remainder of the rooms in the second floor in white wood painted or stained a natural finish. The floors throughout the second floor are rift North Carolina pine and in the attic selected matched spruce. A metile wainscot 4 feet high is carried around the bath room with a tile floor and white enamel iron fixtures.



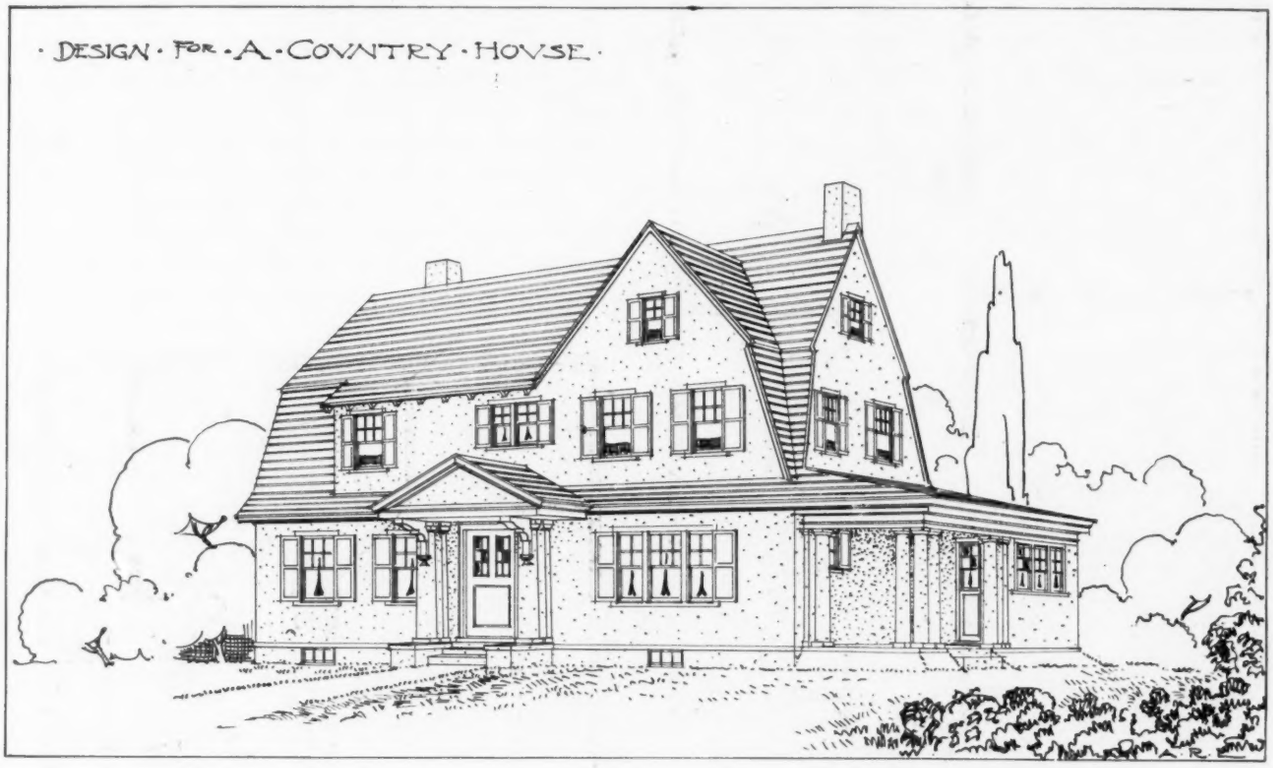
SECOND FLOOR PLAN

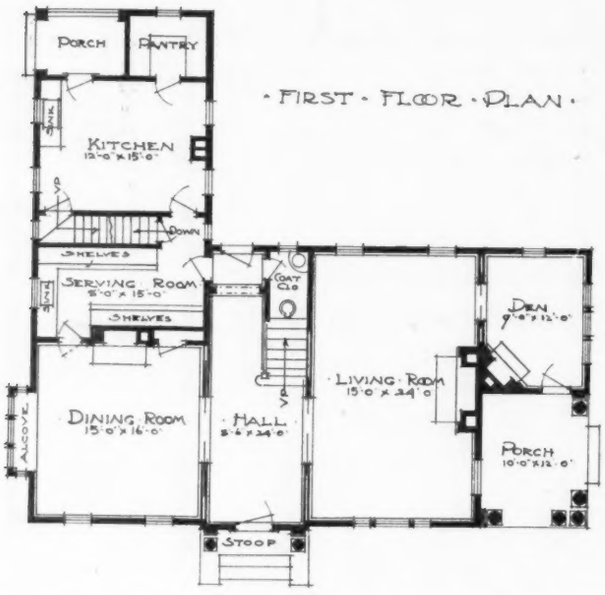
In the cellar the usual arrangement is found as the owner may desire. This house can be well built as described and built at a very low figure, while the

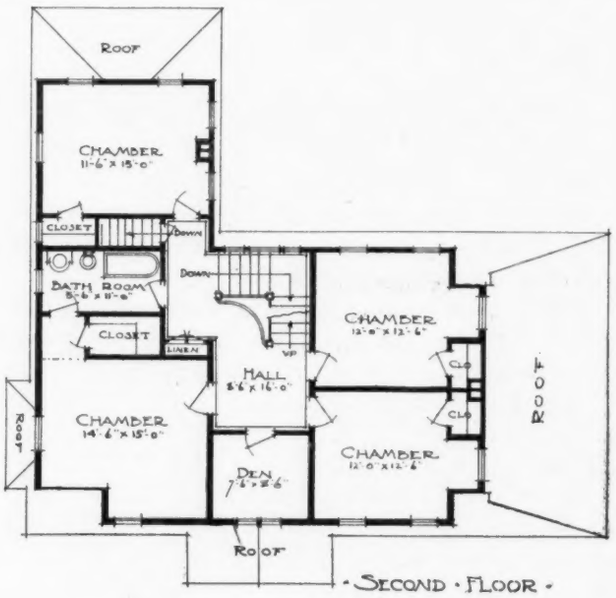
design is so far above the ordinary that it would be rated much higher.

Six-Room Cottage

The six-room cottage with front and side elevation shown on page 797 was designed and drawn by Miss Reba Pim of Lincoln, Neb. Miss Pim a few years ago entered an architect's office as a stenographer. In her spare moments she became fascinated with architectural work and as she was neat in her work and ambitious to learn, she was given odd jobs at tracing of the illustrations in this magazine in connection with his articles are from her pen and so closely has she adapted his style of work that it is sometimes hard to distinguish them apart. The plan here shown is well arranged with good sized rooms and bath. The dining and living rooms are separated by a columned archway, as shown in detail section, which gives a very pretty effect. The house is provided with ample cellar and a spacious attic room which could be finished off into two or more rooms. The exterior presents a very pleasing appearance with its flared base, wide projecting cornice, and the general tone of the building goes to make it a beautiful home at a moderate price. This house was built at Lincoln, Neb., for about $1,500.





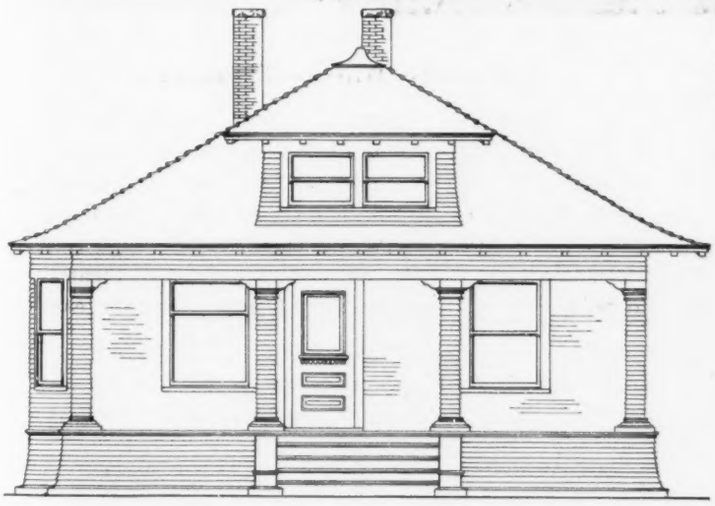


to begin with, her progress was rapid until to-day stenography is only a secondary matter with her, doing only the office work where she is employed. Most of her time has been spent in the office of our Mr. A. W. Woods and for two years was his main help. Many

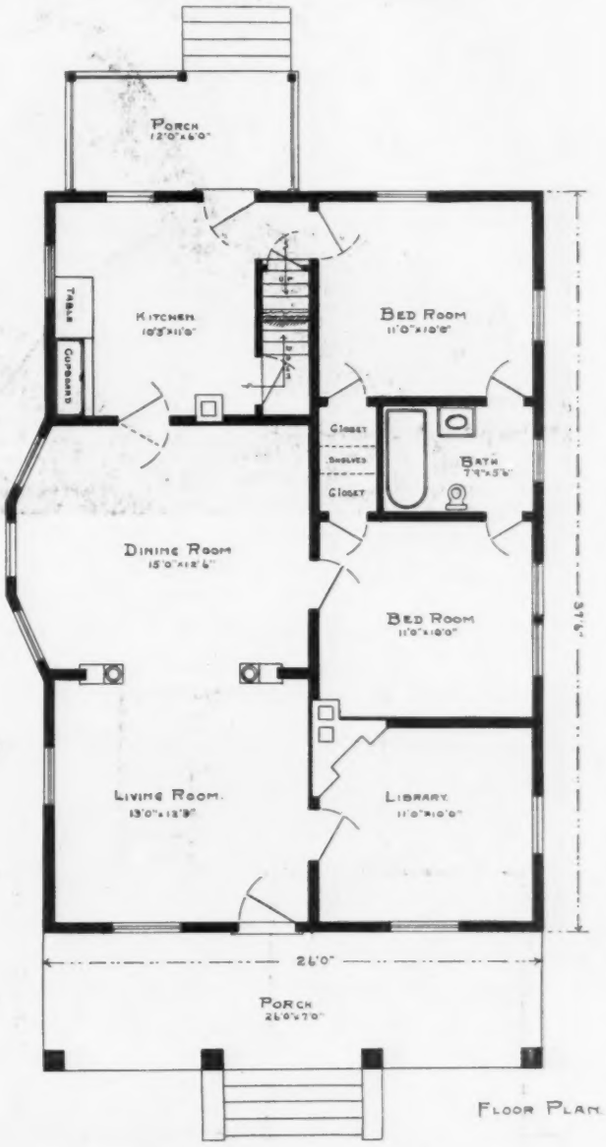
An Indiana House

The house plan, shown on page 798, is designed for small family. A woman with a small family needs or thinks she needs as much room down stairs as though she had a dozen children. The regulation four rooms are just as desirable for a family of two as they are for a family of six or eight, not that they use all of the room all the time, but they expect company, relatives or friends, and they want the house to appear to advantage. In theory two rooms down stairs and two rooms up stairs should hold two persons, but in practice it won't work. But a family of two can manage with two bedrooms all right enough and this plan solves the problem of how to get four rooms down stairs and only two rooms up stairs and at the same time utilize to advantage all the floor space as well as the roof in the main part of the house.

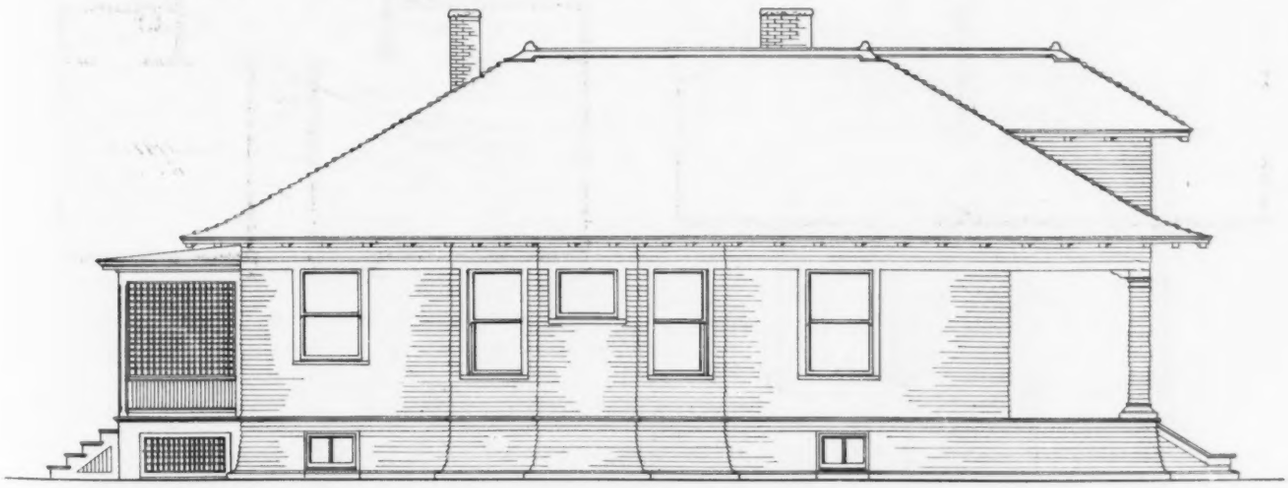
In the back wing the bathroom is tucked away in the attic, occupying space that would otherwise simply provide a gymnasium for spiders and lodgment for dust. The back porch in this plan is a little unusual, but the arrangement is a good one, especially when the house backs off towards the south. A cellarway built like this has many advantages to recommend it. In this plan what would otherwise be waste space above headroom is utilized to advantage for a kitchen cabinet.



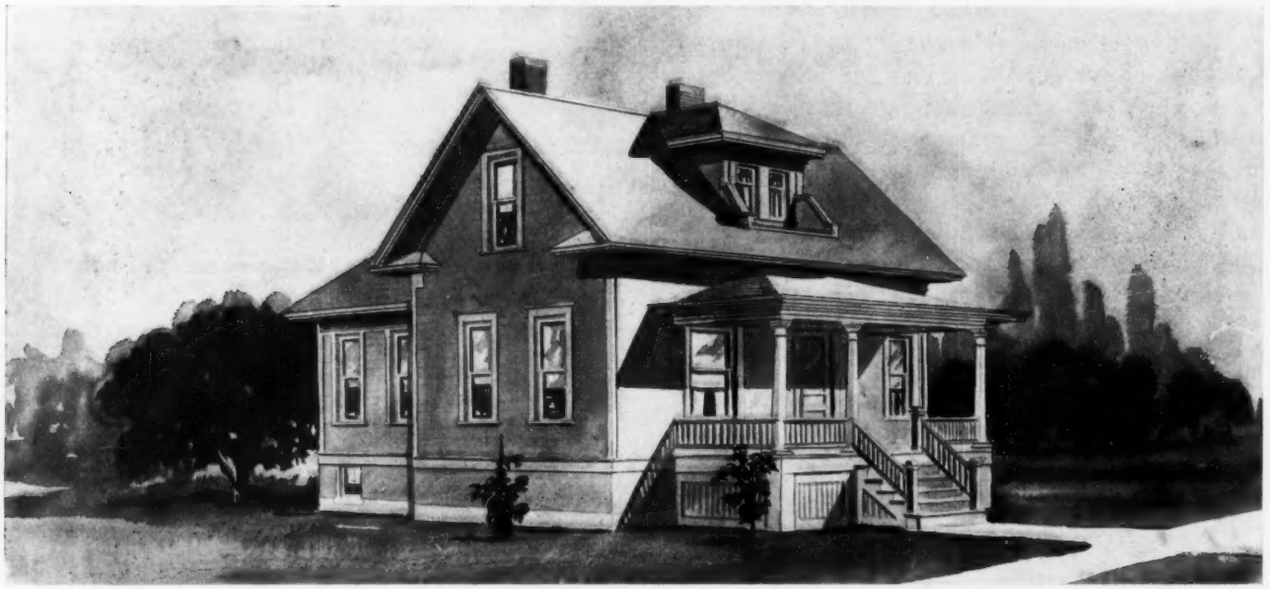
FRONT ELEVATION

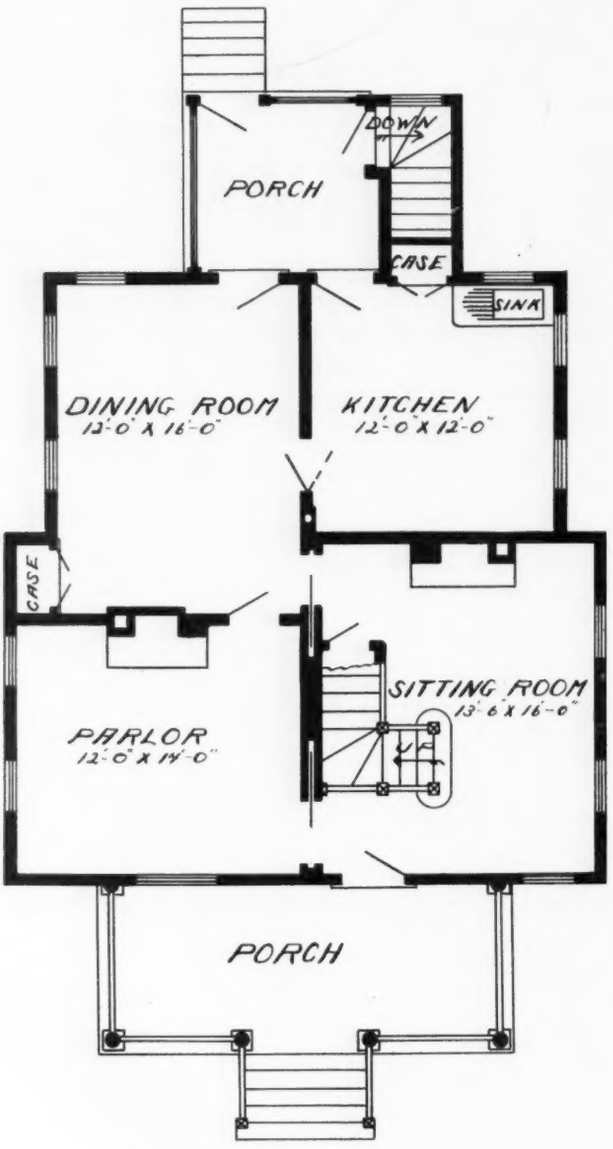


FLOOR PLAN



SIDE ELEVATION

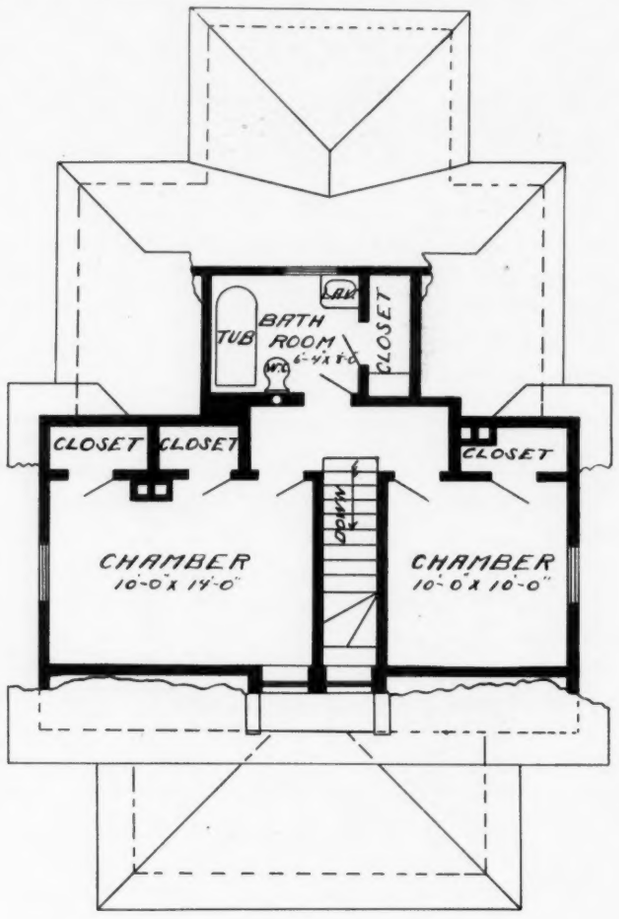




FIRST FLOOR PLAN

Concrete Block Theaters

The Bridgeport Theater Company of Bridgeport, Conn., are now manufacturing concrete blocks for the erection of a large and handsome theater. It is estimated that 50,000 blocks at least will be required, together with 1,500 feet of water table, sills, etc. It is stated that this is to be the first of a chain of theaters to be erected of concrete blocks throughout the east.



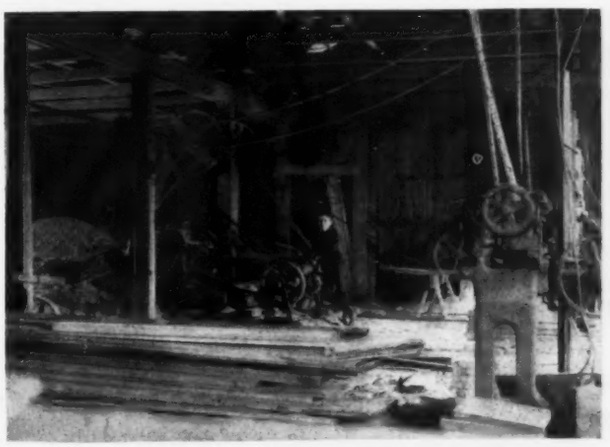
SECOND FLOOR PLAN

Problem of the Shavings Pile

BEST METHOD OF REMOVING SHAVINGS FROM THE MACHINES—COST OF INSTALLING AND OPERATING BLOWER NOT VERY GREAT

THERE is one problem confronts the carpenter operating wood working machinery and the small planing mill man that is very easily solved by the larger wood working institution, but it still remains as a source of much annoyance to the mill running just a little wood working machinery, and that problem is the shavings pile. In almost any machine wood working shop of small proportions you can generally find around the planer a great mess of shavings which not only makes the shop look sloppy, but when it gains large proportions it seriously handicaps and interferes with the work and must be removed in some way to some place, and the question is, how is the best way to move it and where? The planing mill using steam power has a use for the shavings in the boiler furnace, which furnishes a solution to the "where" end, but there still remains the question of "how" to remove them from the machine to the boiler room. But, with the majority of wood workers who have this problem of the shavings pile to contend with, there is no boiler furnace yawning for them, because the power equipment for small institutions of this kind is usually either electric or is a gasoline engine, so the shavings must be disposed of outside the factory. However, the final disposition of the shavings is in itself a small matter, because they can generally be sold for some purpose or other, and the main problem is, how to handle them, how to keep this big pile from accumulating in the way.

It is too well known to need elaboration here how the larger wood working institutions dispose of these shavings. They put in blower systems and take the shavings and dust from every machine through a fan and blow it into a fuel room or storage bin. Any man, even though he may be running only one planer, and that intermittently, may put in the same kind of equipment to dispose of these shavings. That is, put hoods around the cutter heads and a system of piping with a fan to draw the shavings away from the planer and deliver them into a bin or wherever they may be wanted about the premises. What can be done, and what is worth while, though, are two different things, and apparently the majority of those operating just a few wood working machines do not think it worth while to put in a blower system to keep the shavings away from the planing machines. Evidently if they figure on it at all, they figure that the end will not justify the means which it is necessary to adopt for their automatic disposal, for the fact remains that these shavings are left to fly about and pile up around the machine, getting in the way all the time and requiring quite a lot of manual labor to remove them, to say nothing of the inconvenience and loss of time caused



by having to work around and through them while running the machine.

I have been trying to get some figures on this point so as to offer some positive light on the subject, but I find that while the makers of fans for blowing shavings give lots of attention to areas of piping, speed, etc., they do not apparently give much effort to compiling of estimates in their catalogues of how large a fan it will take to handle stock from one ordinary planer, what it will cost to put it in and the power required to run it. That is, they do not show estimates in their catalogues as guides for those seeking information on the subject. Of course, we can readily understand that each wood working machine shop has to be estimated separately when it comes to the problem of equipping with a blower system, but notwithstanding this fact, there is no question but what the builders of fans might give us more information on this subject than they do. From their experience in equipping

various kinds of plants and machines they should be able to form an idea of what would be required to handle the shavings from an ordinary planer, that is, what size fan would be required and the amount of power ordinarily necessary to drive it. With information of this kind before them, even though they make no pretense of being precise figures for each case, it would probably furnish light that would encourage more people who operate a small amount of wood working machinery to put in a blower system.

There is absolutely nothing that compares with a good blower to take care of the shavings as they come from the machine, and I believe any man operating only one planer, and that intermittently, will likely find it worth while to install some kind of simple blower system. It need not take much power, especially if all that is to be done is to take the shavings coming from the machine and deliver them outside without having to elevate them to any considerable amount, and in many instances a man can unquestionably make a fan himself do this work and provide wooden spouts. Probably the easier and better plan, however, would be to purchase a small fan, and then, if desired, one can make a wooden discharge spout, but the hood over the planer must be metal, otherwise it will soon wear out. If a planer only runs intermittently, the thing to do is to provide your fan with a driving equipment which can be stopped and started, so that you need not have the fan in operation except when the planer is running. If the planer is driven from a counter shaft and you can arrange to drive your fan from the same counter shaft, this matter of running the fan only when the planer is running will take care of itself. And even where this is not practical, it ought to be comparatively easy to rig a counter shaft with a light and loose pulley for driving the fan so that it need not be kept in operation when there is nothing doing at the planer. With this provision the power used in disposing of the shavings should be cheaper in the end than the labor that would be necessary to clean up and remove the shavings that have accumulated around the machines, and it insures a cleaner shop and facilitates better and nicer work all the time. It's a subject that needs more attention than it seems to be getting from the carpenters and building contractors who only operate a few wood working machines, for those accumulations of shavings are certainly a nuisance in any shop, and if they can be gotten out of the way with a blower, without adding materially to the expense account as compared to removing them by hand, it is rank foolishness to continue in the practice of permitting them to accumulate around the planer, interfering with the work.

Onward March of Concrete Blocks

DEMAND INCREASING FOR BLOCKS WHICH ARE ARCHITECTURALLY ATTRACTIVE AND ORNAMENTAL—REMEDIES FOR EXISTING DEFECTS EAGERLY SOUGHT

By Harmon S. Palmer

THE time has arrived when an observing public begins to realize that concrete hollow blocks, properly made, are to supersede inflammable material for buildings designed as residences. The fact that fireproof buildings can be made as cheap as wooden ones, the architectural effect more beautiful and the lasting qualities greatly enhanced, is one of the greatest boons to humanity. Because of the millions who have perished in inflammable buildings, and the constant danger to millions more, the time will surely come when it will be a crime to erect a building that can burn. The world will rejoice when this time arrives, not only by reason of safety and enhanced appearance of cities and towns, but because of the economy in repairs, the saving of yearly painting and other bills, including the great but necessary bill for fire insurance—for with proper construction in Portland cement concrete fire insurance becomes entirely unnecessary. While this may seem a bold assertion, it is not too strong. Floors, ceilings and roof should be made of the same material, as well as windows and doors and their frames and casings. With such construction a building becomes absolutely fireproof, except in the midst of many other inflammable buildings.

You have read and reread the numerous catalogues on this new cement block industry, every one of which has pictured in glowing terms the fortune for those who would invest in this or that machine. You have also learned that many have proven failures, and buildings have been erected which have proven anything but satisfactory. You have also learned that many buildings are a complete success and a delight to their owners. In view of these facts is it not plain that success must be found within certain lines?

The industry needs men of a mechanical education as well as a builders' education. An architectural education is also essential for producing all the pleasing effects of which this new method is capable. But while this is desirable, there are many who will sacrifice beauty for lower cost—a condition to which these blocks are peculiarly adapted. This is the cause of so much just criticism of buildings erected of these blocks; it costs money to follow intricate designs of angles and embelishments in any material, but much more when using hollow blocks unless they are adapted to fit in the building without cutting and fitting them after they are cured. It is much easier and better to set the machine and make them right at first. Such machines also cost money, but owing to the fact that so many have been advertised as costing but little, many have gone into the business with them, the result being the prevailing uncompromising square house.

The same may be said of face designs; these also cost money, and many who would embark in this business start out with the cheapest outfit, expecting to increase their facilities after putting up the first building, using their profit to buy additional attachments as wanted. But here again unforseen difficulties arise, for the cheap machines are not adapted to the numerous changes which will be called for, so that in many cases the purchaser will stick to what he has rather than discard it and start again with what he has learned would be better. To say that a cheap machine would not make a good house would be wrong, but the fact remains that many are erected which are entirely lacking in architectural effect.

The buildings of the future will be of hollow concrete blocks with all the pleasing effects of which any other material is capable. The reason for this is because of the lower cost of concrete blocks, together with their sanitary qualities. The hollow space makes a light, ventilated wall at a reduced cost, and the great strength of Portland cement renders a solid wall unnecessary. This is the whole thing in a nutshell.

It costs just as much to make a cubic inch of good concrete as it does to make the same amount of good brick. Why, then, do we favor building with hollow concrete blocks? Because we can use less raw material in the first place, and in the second place we can build so much faster. An ordinary hollow block will displace from thirty to forty brick in a wall and can be laid in half the time, so that when architectural effects are omitted, the builder has sacrificed beauty for cheapness. But with the apparent advantages, architects will compel builders to follow their more pleasing designs, and investors will compel the architects to produce them. Why do they not do so now? Because the average architect has his reputation at stake, and being unacquainted with the details of hollow block construction, and not wishing to incur the time and expense necessary to learn, he naturally sticks to that which he has already learned. Besides in many cases he must rely upon the honesty and integrity of the man who is to furnish the blocks for his building. He knows as well as anyone else that many such men are trying to get out whole with a small investment, that their knowledge is perhaps no greater in the manufacture of concrete than his own, and that there may be great difficulty in producing such blocks as his plans call for. Therefore is it any wonder that an architect who considers his reputation, and who must make a living for himself and family, prefers to say to a prospective customer, "You had better build with brick or some other known material," and in justice to themselves and to the hollow block business they are perfectly excusable in their advice.

But this condition is only temporary. Experts are fast coming to the front, both in the manufacture of competent machines, and also in the manufacture of perfect and shapely blocks. They can explain to the architects the co-operation of the machine with the most advanced architectural designs. In many cases some very eminent architects have taken up this branch as a sole occupation, and in connection with the machine manufacturer are rapidly bringing order out of chaos, by filling the appalling gap between the novice and the educated builder.

Again, as the demand increases for these buildings the defects which were so prominent at first are being overcome. One of these being the porosity of the average concrete block. While this was in most cases due to inexperience in others, it was also due to such material as was available and had to be used, in which case many defective buildings have been erected to the great detriment of the industry. But, fortunately, discoveries and experiments in this direction have completely mastered this situation, so that at the present time there is no excuse for putting blocks into a building that will let moisture through. Waterproofing compounds are now known to be both effectual and as lasting as the stone itself, and very cheap.

The great question as to wall construction has been settled, so that definite dimensions of blocks and their webs have been determined, eliminating the necessity of cobble construction, or such a multiplicity of cavities as to add greatly to the cost of the block and much more to the laying in the wall, besides obviating that great difficulty of proper subdivisions.

Gradually the darkness and the difficulties incident to all improvements are passing away in this as in others which have come before. Hollow concrete blocks of some kind are now used all over the world, their merits are discussed by competent builders and architects all admit their universal use in time and all are ready to adopt them just as soon as standards of measurements and quality are proven correct. Men who are proficient in their callings, either architect or builder, will not take the word or product of those unacquainted with the art of proper construction. The great disideratum at the present time is ornamentation. It must come from talented devotees of the block, in connection with the machine manufacturer. Neither can do it alone unless expert in both branches. It will never develop by calling attention to this or that palpable defect by newspapers or conventions, unless someone can point out a remedy, and that is what we all want and all should strive to find.

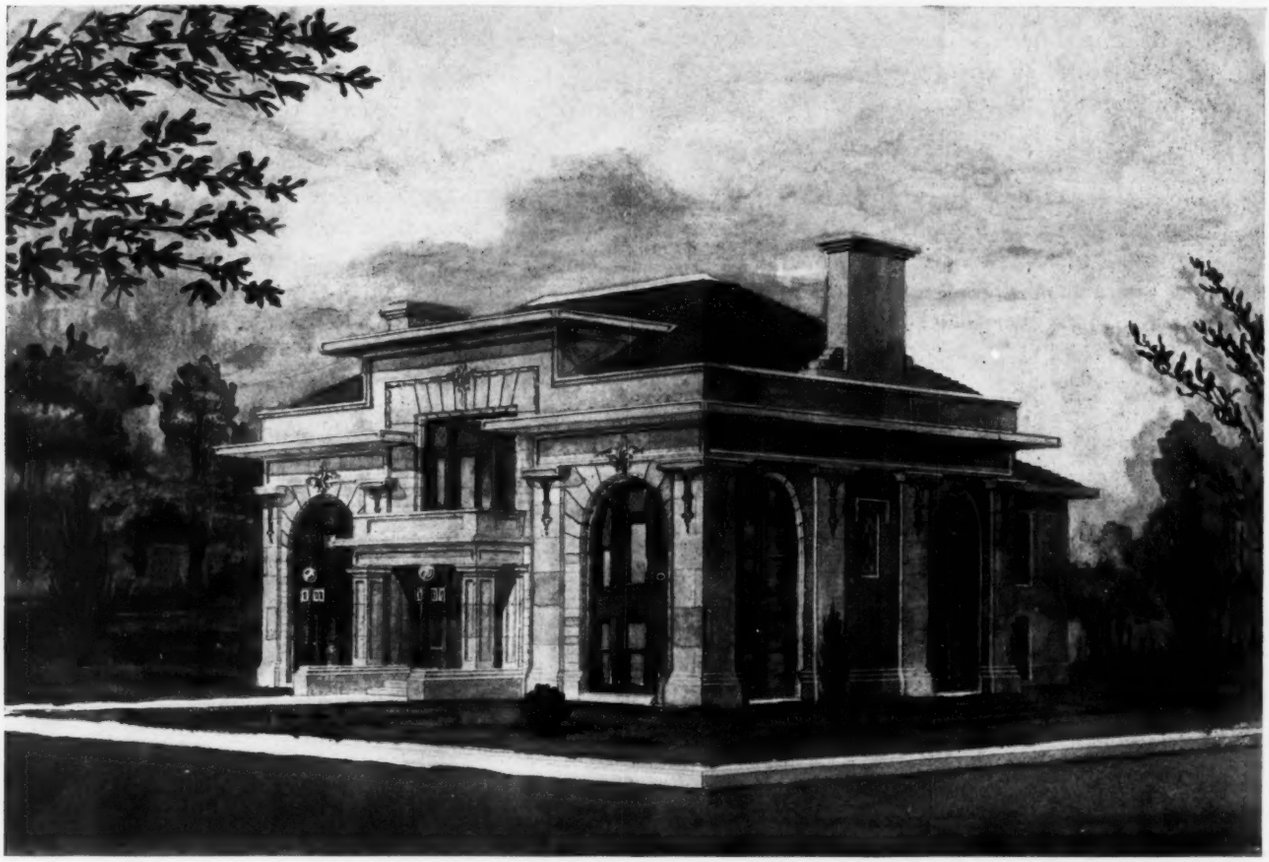
Fireproof Stairways

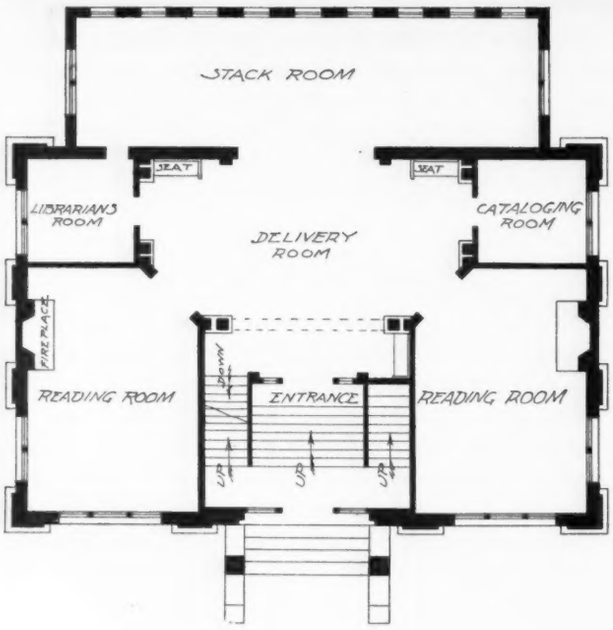
Circular fireproof stairways represent a further adaptation of fireproof tile to modern building. In the New York custom house two pairs of semi-circular fireproof stairways have been built, leading from the sub-basement to the top floor. In many respects these stairs represent an extreme advance in the fireproofer's art. They consist of hard burnt tile slabs built up in the form of the arch so that they are self-supporting and entirely secure against any damage from fire.

Two Modern Libraries

PERSPECTIVES AND FLOOR PLANS OF TWO LIBRARY BUILDINGS WHICH OFFER SOME VALUABLE SUGGESTIONS—SPECIAL FEATURES OF EACH MENTIONED

THE library shown on page 803 is being built at Des Plaines, Ill., after the plan made by G. W. Ashby. It is being built of Bedford stone with paving brick between the first story windows. This combination makes the exterior very attractive. The shape of the building is very unique, but is very suitable for a triangular lot. The basement, which extends under the entire building, contains the heating and ventilating apparatus, storage room for coal, two toilet rooms and two club rooms. These club rooms are underneath the reading rooms and are connected by wide arches, making in reality one large room, which can be used for various gatherings. The main floor is divided into two reading rooms, the stack room and the delivery room. Two arches separate the reading rooms from the delivery room, and the location of the librarian's desk enables her to have a complete view of both reading rooms, which is a very desirable feature.



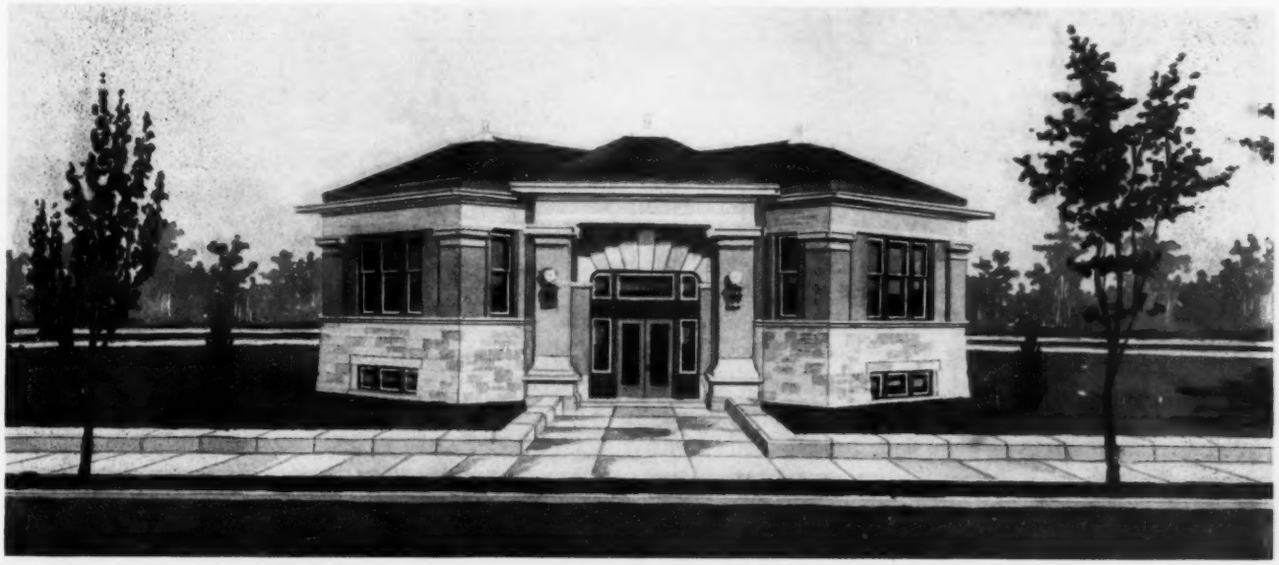


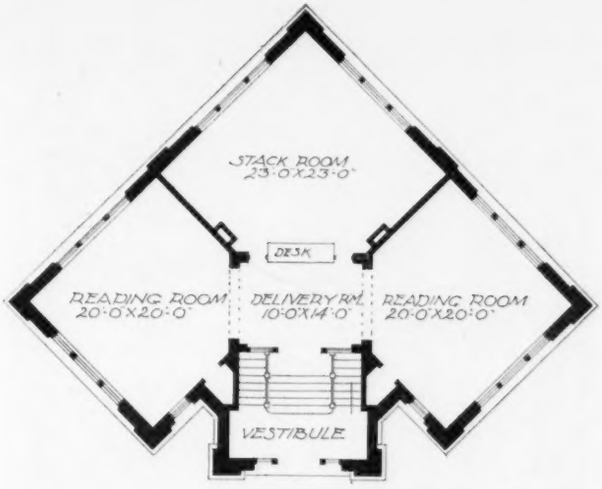
The windows are well arranged, so as to throw all the possible light into the reading rooms, and this is a very important feature in library construction. All the rooms on the main floor are connected, and this is possible in a library building, as it is taken for granted that everyone will be perfectly quiet while in these rooms. The floors are protected with cork mats, which will deaden all the sound of persons passing back and forth, and the result is perfect quiet in the reading rooms. The cost of this building is less than $6,000 complete.

Modern Library Building

A library which combines utility and comfort comes as near to the ideal in this line as it is possible to get.

The design shown on page 802 endeavors to combine these two features. The reading rooms are both equipped with large fireplaces, which are ornamental in summer, but prove to be very useful during the fall and winter. There is nothing that has the tendency to keep one indoors and read as an open fireplace, and we would here suggest that they be placed in public libraries more often than they really are.





Why Cypress Wood Sinks

Southern lumbermen take great delight in a story of certain scientific gentlemen who were sent by the government at Washington to study the growth and uses of the bald cypress at a time when cypress lumber was comparatively new to the market. They went direct to a large camp, presented credentials to the superintendent, and watched with minute care the processes of cutting the timber and floating it down stream.

Cypress is a light, spongy wood that grows in swamps and absorbs water readily. The scientific gentlemen requested the superintendent to throw some logs into the river separate from the main rafts and followed their progress down stream in a boat. After floating south for some distance the logs with one accord sank. Much surprised, the scientific gentlemen returned and followed another consignment. The phenomenon was repeated; at a certain distance from the camp all the logs sank.

The gentlemen from Washington, being very scientific, did not think to question the unlettered superintendent about the power of cypress to become waterlogged, but after numerous observations and much comparing of notes reported to their department the startling discovery that cypress floated north of a certain parallel of latitude and south of it invariably sank. Of the cause they were not yet certain, but hazarded the suggestion that it might lie in the rotary motion of the earth, increasing in speed as the logs approached the equator until it was powerful enough to draw them under.

Use of Peat in Brickmaking

In Germany they are mixing coal and peat, making a compressed mixture, which has been used as fuel in a brickyard with a result so favorable that it will no doubt open a new field for the use of peat fuel in brick manufacture. In the neighborhood of Jevers, Oldenburg, an excellent heavy blue clay is found which was considered suitable for the manufacture of hard clay paving bricks. All efforts to manufacture such bricks from this clay proved unsuccessful until a mixture of one part of peat and ten parts of coal was tried as fuel. The result was a hard, brown brick instead of the light red brick which was produced formerly. The experiments were repeated until at last a first-class brick was produced. So much for fuel in brick building.

There's no time to begin like the present.

PLUMBING

WM R. MARSHALL

Soil, Waste and Vent Pipe Installation

INSTALLATION MUST BE SUCH AS TO PREVENT ANY LODGEMENT OF SEWAGE — ADVANTAGES OF CERTAIN SYSTEMS THAT HAVE GIVEN SATISFACTION

THE soil pipe and fittings in good plumbing should be first-class; the installation, such as to prevent secretion of rust, lodgment of sewage and to permit free circulation of air throughout the system. The F. & W. system consists of a patented invention of a combination drainage and vent fitting in which it is impossible for secretion of rust

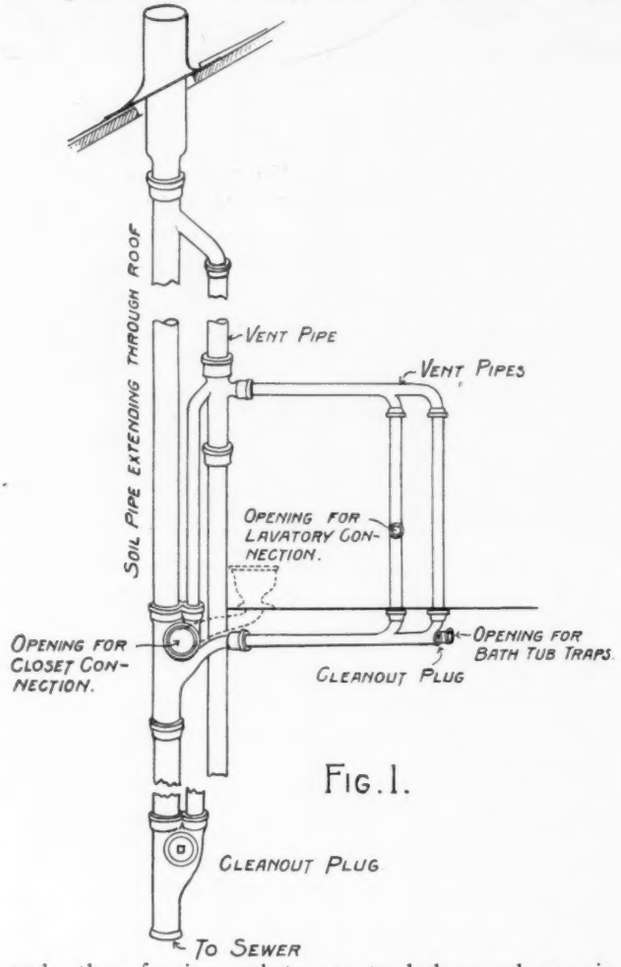
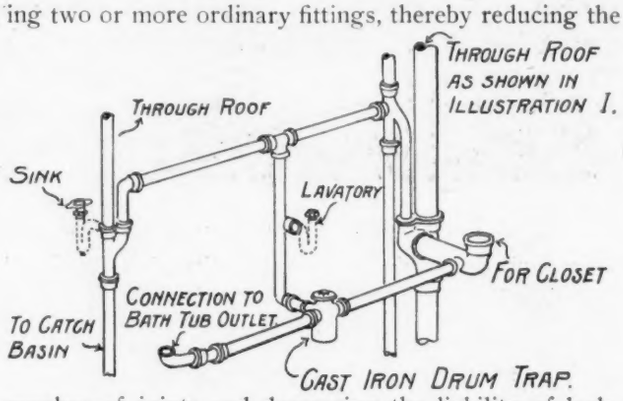


FIG. 1.

and other foreign substances to lodge and remain. Fig. 1 shows a combination of fittings for a set of bath-room fixtures, including closet, lavatory and bath tub. A very important advantage devised from this installation is that only cast iron is used in the vent, waste fittings and connections; it being an acknowledged fact that cast iron will last twice as long as either wrought iron or steel under the same conditions in a similar combination.

The F. & W. system has the advantage of displacing two or more ordinary fittings, thereby reducing the



number of joints and decreasing the liability of leakage. Any rust formation in the vent pipes falls into the drainage part and is washed away by the flow of water from the fixtures. As there is positive circulation through both the vent and revent pipes at all times, syphoning is impossible. The curves and angles are easy and are made with the object in view of decreasing friction to a minimum.

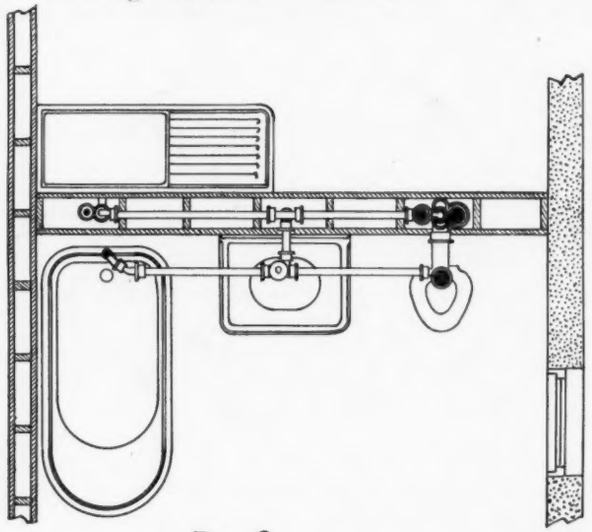


FIG. 2.

The vent pipe, which is two inches, is connected into the four-inch soil pipe at a point just under the roof and the soil pipe is increased to five inches as

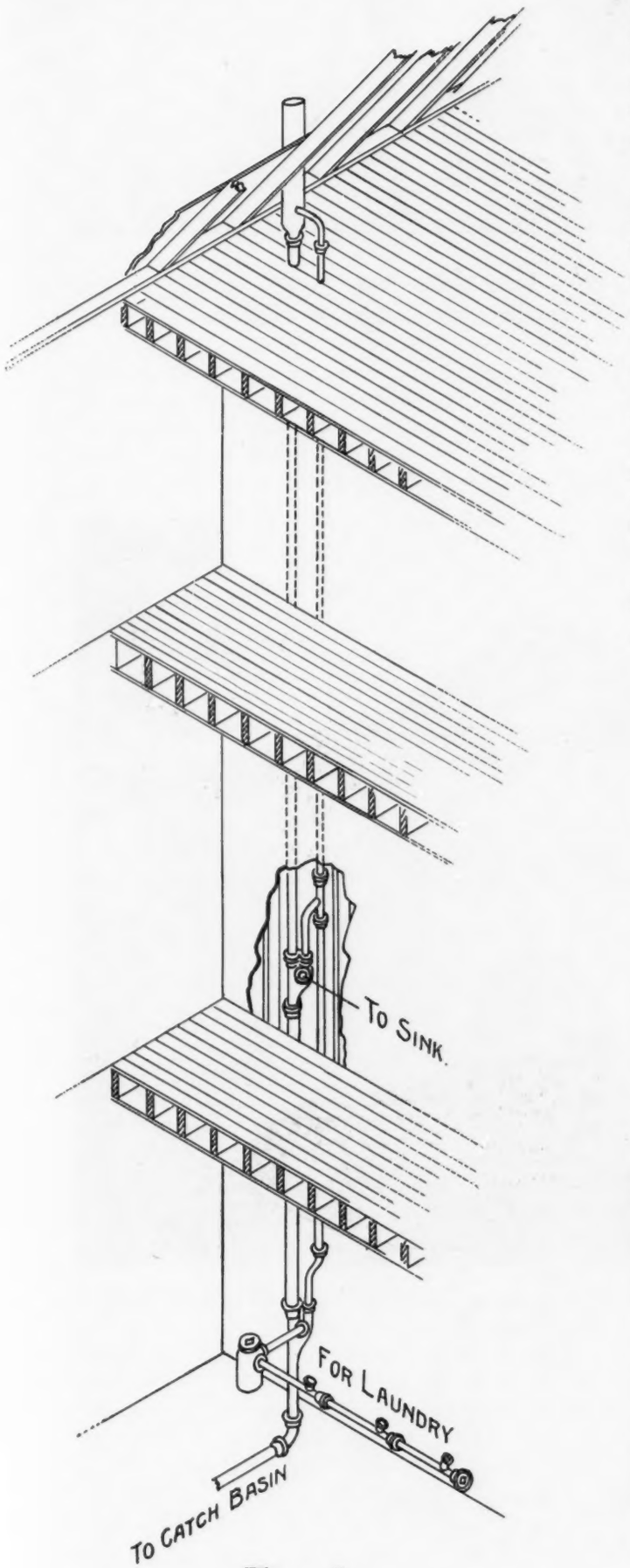


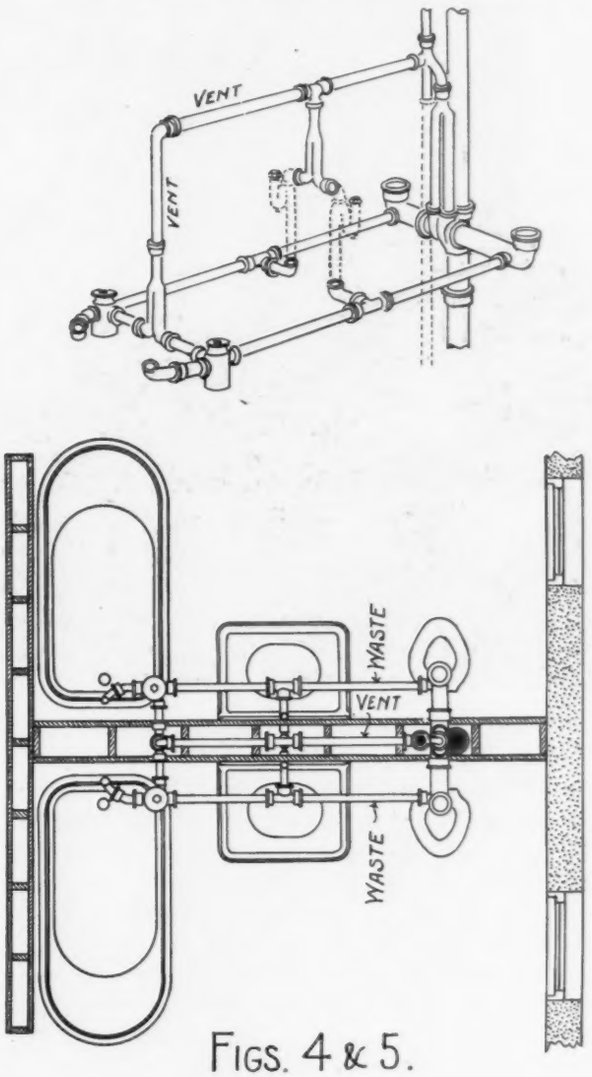
FIG. 3.

it passes through the roof. In the basement the vent pipe is connected into the special soil and vent tee at the foot of the stack. This allows any rust scales to fall into the tee and are washed into the sewer by the flow in soil pipe. This connection also permits the circulation of air.

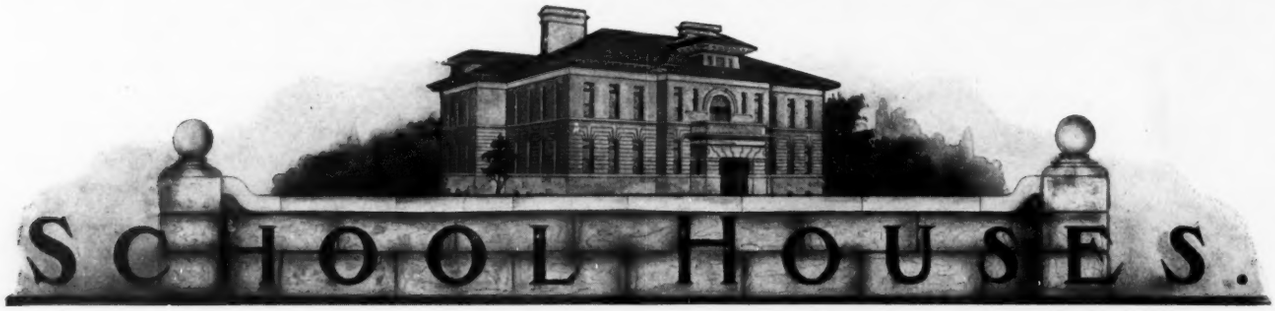
Fig. 2 is a combination for bath tub, lavatory, closet and kitchen sink. The plumbing ordinances of many cities require that the sink waste pipe be run independently to a catch basin to intercept the grease and prevent it from entering the main sewer. In this installation one stack of revent pipe is saved, the reventing (which should always be done) is accomplished by connecting into the bath run stack. The cast iron drum trap is desirable from a standpoint of durability.

Fig. 3 shows manner of installation for kitchen sink and laundry tub in basement. These two fixtures discharging into a catch basin and from these to main sewer.

Figs. 4 and 5 show arrangement for double bath room. One soil pipe and one revent stack being all that is necessary, a marked economy in labor, material and space, and yet a high grade of efficiency.



FIGS. 4 & 5.



Public School Building

SHOWING DETAILED CONSTRUCTION OF ALL PARTS OF THE BUILDING—METHODS OF DEADENING FLOORS SHOWN, AND SIZE OF TIMBERS USED

WE ARE this month illustrating a public school built at Maywood, Ill., by G. W. Ashby, architect. It was built of red pressed brick and trimmed with buff Bedford stone. One-half of this building is being used for a high school and the other half for a grade school. As soon as the new high school is built the assembly room in this building can be divided into two rooms or it can be left as it is at present, as it makes an ideal place for holding exercises and entertainments. The interior trim is cypress throughout.

The longitudinal and transverse sections here shown are of the new addition which has recently been built. It gives the dimensions of the various timbers and shows the location of the doors, blackboards, stairways, etc.

The sections through the joist here shown give two methods of deadening floors, the lower one being used in this case. This problem of deadening floors is a very important one in school house construction and as we have been asked about the various methods used we show the best way as used in this building. This is also shown in the transverse section, under all second story floors.

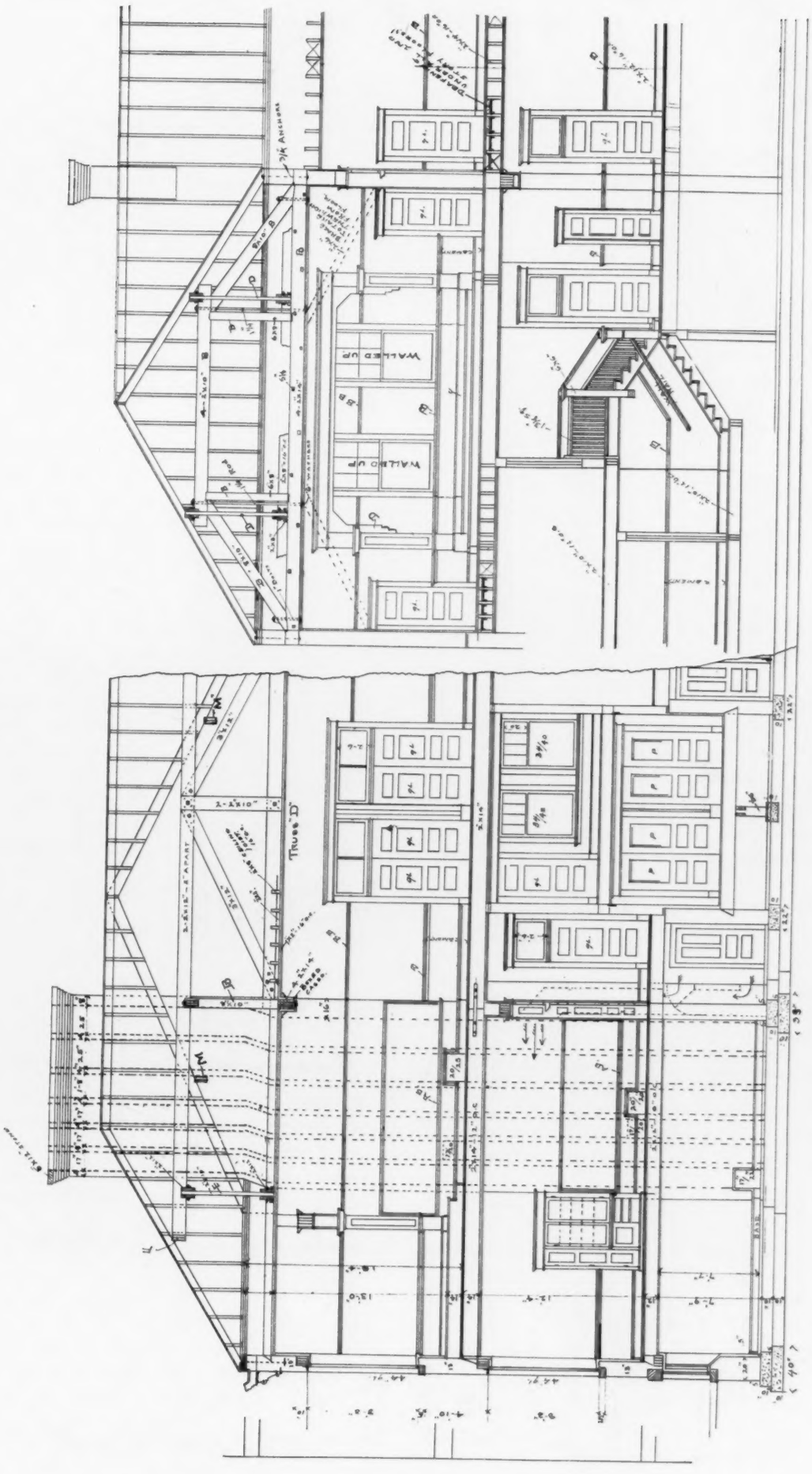
The material used is common mortar, just enough mortar so that the sand will not sift. This will prevent any ordinary sound from penetrating through to the floor below, although such sounds as children marching in unison cannot be completely deadened.

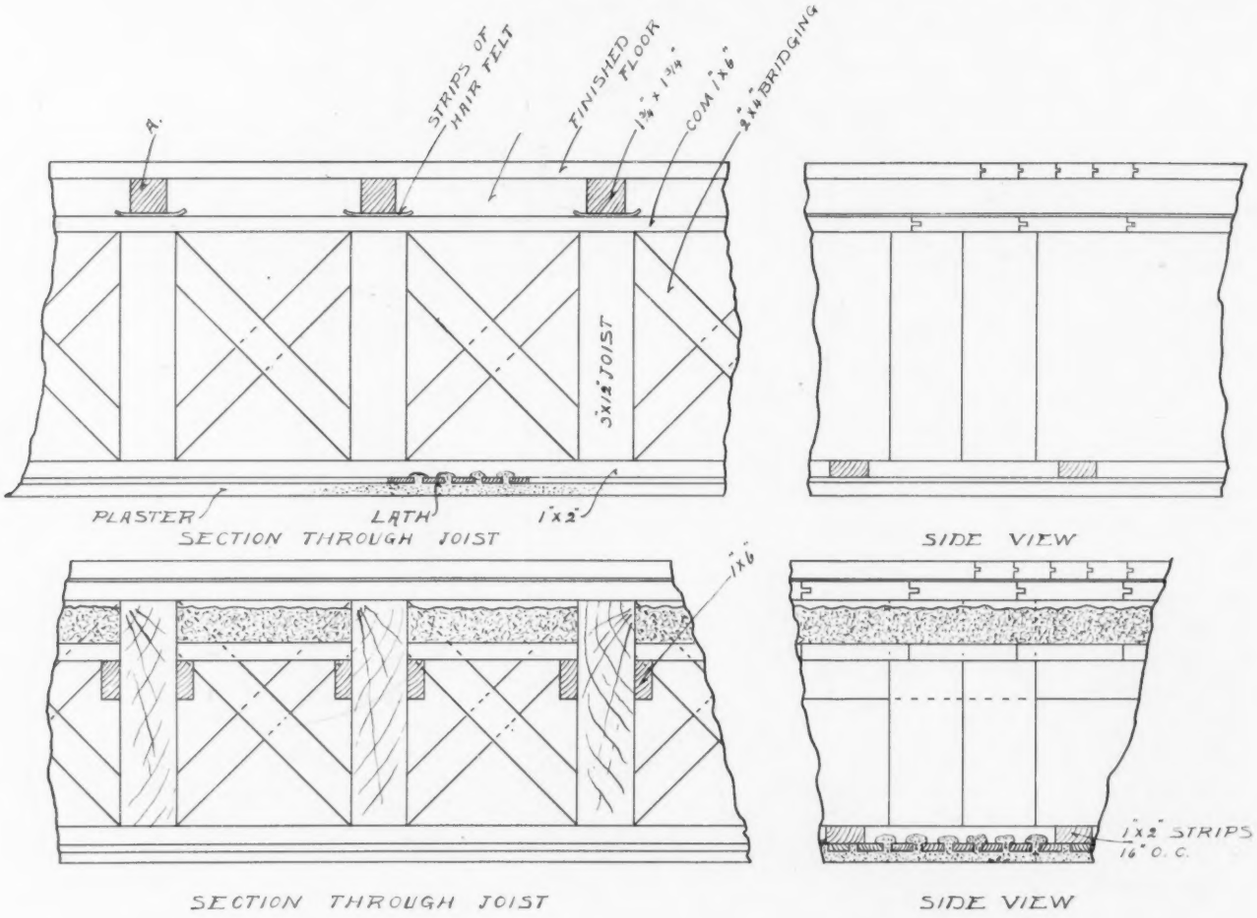
⚜

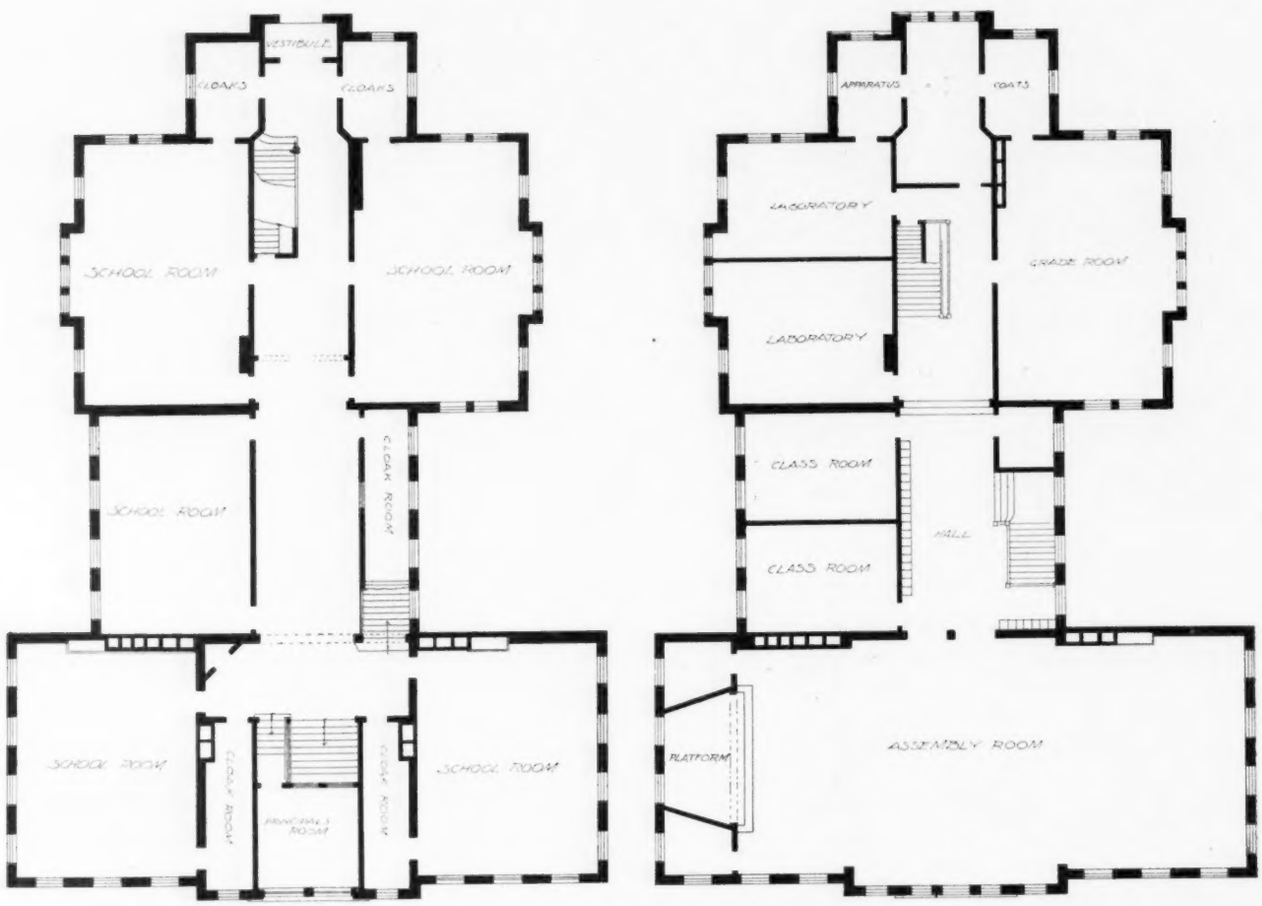
Keep to the trail. Success lies in continuous effort along a certain line.

⚜

One experience is worth more than ten theories.


WALLED UP
WALLED UP
Truss "D"


STRIPS OF HAIR FELT
FINISHED FLOOR
1¾" x 1¾"
COM 1"x6"
3"x8" BRIDGING
A.
3"x12" JOIST
PLASTER
LATH
1"x2"
SECTION THROUGH JOIST
SIDE VIEW
1"x6"
1"x2" STRIPS 16" O. C.
SECTION THROUGH JOIST
SIDE VIEW


VESTIBULE
CLOAKS
CLOAKS
SCHOOL ROOM
SCHOOL ROOM
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CLOAK ROOM
SCHOOL ROOM
APPARATUS
COATS
LABORATORY
GRADE ROOM
LABORATORY
CLASS ROOM
HALL
CLASS ROOM
PLATFORM
ASSEMBLY ROOM

Ornamental Products*

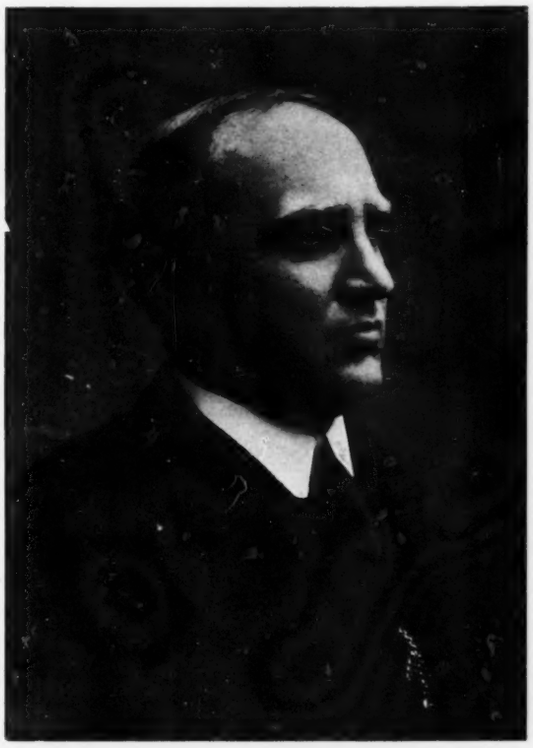
WHAT CAN BE PRODUCED IN THE LINE OF CEMENT STONE—BEST KINDS OF FORMS TO USE TO OBTAIN GOOD RESULTS

By E. C. Harter

CONCRETE or cement may be made in almost any ornamental or architectural designs by various methods.

It may be cut as other stone or marble is cut by the stone carver, cast in sand, or moulded in various wood, composition, rubber or iron moulds.

The sculptor or stone carver can, without a doubt, produce finer and more elaborate work than is possible by casting or with moulds of whatever description, and while I believe that there will be call for hand-carved concrete stone in the future, at present those wishing to invest the amount of money necessary to produce this class of work prefer to use natural stone, granite or marble.



E. C. Harter

Casting cement stone in sand is a simple and practical method, where the operator has the ability to mould and draw patterns.

It is best that patterns be of metal and nicely finished, the same as those used in an iron foundry. By using various cores or fillers, cut underwork may be made by this method. It is necessary to use a mixture having sufficient moisture to admit of pouring or even running it through hose.

The stone made by this process is of good quality and has a fine surface.

Rubber or Elastic Moulds. On account of the slow setting of cement it is not practical to cast concrete stone in gelatine or glue moulds, as plaster of Paris is cast, but I have seen very nice work made in rubber moulds that are vulcanized onto the form desired, and encased in a perfectly fitting metal form to hold them in place until the concrete is sufficiently set to admit of removal. The rubber seems to cleave freely from the cement and very elaborate stone may be gotten out in this way.

By far the most economical method of making ornamental work from concrete is to use metal moulds. Very nice designs are possible by this method. The models from which the patterns are made must be gotten out by an architectural moulder in play.

The details may approach very nearly those of the stone carver, but cut under work must be avoided, unless fillers are used, which is possible in some cases.

Basing an estimate to the cost of ornamentl stone on labor at $2.00, cement $2.00 and sand $2.00 per yard, the cost of a reneaissan baluster post made in a metal mould is about 10 cents, while the cost to cut them by hand in natural stone would be $10 each.

In the past stone of this class had only been found on the boulevards and finest residence streets, while in the future, with the help of concrete, this class of work will be used in the medium and even low-priced buildings.

The virtues of concrete should put it in a class by itself. It should not be called artificial stone. It is stone, and of a better and more lasting quality than the averag natural product.

The cheapest cut stone is what is known as rock-face or pitched. It seems this is the style the manufacturers of stone machines have been called upon to imitate, and while it is the easiest to make from natural stone, it is the hardest to imitate with moulds.

Although the patterns may be made directly from natural stone, the concrete will have the moulded effect, which is disappointing.

Real rock-face or pitched stone may be made from concrete by making the face of sufficient thickness, of fine material and when well cured, pitch it with stone cutters' tools. This will produce the desired effect, but will leave the surface more porous than the moulded products.

Beautifying cement stone by mechanically finishing the surface has not had the attention of the artisans that it is worthy of.

Some very fine laboratory specimens of polished work have been produced, but I find that by exposing them to the elements for only a few days the luster or highly polished surface changed to a dull finish.

I firmly believe that this is the result of the continuation of the chemical action of the cement in the mass and is caused by further crystalization. All of the specimens of this work that I have seen have been upon newly made samples.

*Address made at the Concrete Machine Manufacturers' Convention held at Detroit, Mich., August 8 and 9.

Should the highly polished surface be produced on stone that is thoroughly cured there is no reason why it should not retain the polish.

When the progress that has been made in the manufacture and use of cement stone during the last five years is taken into account, those engaged in this have reason to feel encouraged, or even optimistic.

Every season's cut of lumber necessary for the thousands of buildings constructed in our country raises the price of that commodity and unless the production of concrete stone increases in a greater ratio than the timber decreases, we will surely be afflicted by a lumber famine in the comparatively near future.

The advancement towards practicability and beauty in concrete stone, which is now generally admitted to be the most durable of building materials, lies almost entirely in the hands of those who engage in the manufacture of stone machinery, and from past results I am satisfied that the building public appreciate what is being done along these lines.

Foreign Trade*

GREAT FIELD OPEN TO CONCRETE MACHINE MANUFACTURERS—METHODS OF REACHING PEOPLE IN FOREIGN COUNTRIES

By Mentor Wetzstein

I HAVE been wondering why our secretary saddled upon me such a red tape proposition as the reading of a paper on foreign trade, nor do I know why or how he reached the conclusion that I was in a position to give out much information with reference to this very intricate and complicated subject, and I must therefore ask your indulgence because of the shortcomings of my paper and its dealing to an extent in generalities.

"Foreign Trade" has a world of meaning, and we Americans, like Monte Cristo, can indeed cry the "world is ours." Every foreign country lays her purchasing toll and tributes on the shores of our land—these great United States. The ingenuity of the Yankee nation in producing articles and machinery that appeal to the people of other lands has won her a market throughout the world, and one has but to read the business agency reports to learn the marvelous and astonishing results and the great tonnage sent from our ports. Government reports show a continual increase of exports over imports until even these figures have swelled into the hundred millions on the credit side of Uncle Sam's foreign ledger account, a complete reversal of former conditions, when our imports far exceeded our exports by millions upon millions. Urgent business that has kept me in Canada the past fourteen days has prevented my obtaining and presenting to your notice exact figures and statistics, but I hope at some future meeting, if again honored, to prepare a paper that in the preparation of my subject I will be able to give it more careful thought and study.

No country on earth is doing so much for the business man and manufacturers as the United States—in every foreign land, in every clime, in the smallest principality, our government has stationed its consular representative, wide awake, vigorous, energetic, with his country's good in heart and mind he is our foreign watchdog, sending in his reports, his observations, his suggestions, and, to use a slang expression, "he plugs the game for his country." If the manufacturer sends forth his representative into a foreign land he gets in touch with the consul, who may be styled an advance agent. Respected in the office he holds, he is in a position to introduce the American salesman and the balance comes natural and easy—a sale is made. No manufactured article has a better field in the foreign country than the block machine; it is like Castoria, they cry for them. In the tropics they find a ready market and their sale depends upon proper exploitation only; the opportunity is there, if we but grasp it. We have been busy here at home and have in reality neglected the foreign opportunity that has been knocking at our gates—luckily for us our product is so strictly American that its manufacture has not been attempted abroad, and hence has not suffered competition. We, however, have not sought nor have we properly gone about it to secure this foreign trade. Instead, they have sought our block machines, recognizing the merit of the material they produce. We belittle in our own minds the intelligence of the foreigner who sends us in an inquiry. Most of these inquiries are in foreign language, which we are obliged to have translated, and although it is so self-evident, by the very nature of the inquiry, that the man at the other end of the line is not in a position to write us in our own language, yet with supreme indifference as to conditions there, we send out our package of voluminous printed and illustrated matter, and if we do not get results, we are disposed to say that there is not much to be obtained by going after foreign trade. This is all a mistake, and those of us who have developed some business in that direction are realizing the force of this criticism every day of our lives. If we hope to have concrete block machines taken up by the foreign element and induce them to buy in large quantities, we must first place ourselves in the position of the man at the other end who is sincerely seeking information, and, second, send him such matter as will in the briefest and most comprehensive manner convey to him the merits of our proposition. We spend our money in advertising in export journals, and after doing so and receiving inquiries, we absolutely neglect the fundamental prin-

*Address made at the Concrete Machine Manufacturers' Convention held at Detroit, Mich., August 8 and 9.

ciples of trying to make things clear to the people who have sent the inquiry to us. I dare say your experience has been on the same lines as ours. Long ere we spent a dollar in advertising that would reach foreign shores, we received inquiries from far off lands asking about our machines. We often wondered how they got onto it. Undoubtedly American journalism as exemplified in papers and magazines should receive the credit—they reach the world over, and many is the tourist who, leaving our shores lands across the sea plentifully equipped with our readable literature, which likely finds its mission in disseminating knowledge of concrete and concrete machinery, and since concrete is destined to be king, how can they keep it out of the land of kings and queens, princes and potentates? True, it is indeed galling the amount of work entailed and red tape necessary to make an export shipment, but the business generally comes to us with only an advertising effort, and coming thus easy we should not complain—perhaps reciprocity will some day change it all; perhaps even now the Pan-American Congress deliberating in South America is laying the plans of simplifying these present annoyances; perhaps as our representatives are flitting about among the peoples of that country they are telling of our products, and having cast the stone into the water the ripple of the waves will wash unto us the benefit. Let us strive to get more of this trade. Let us be the benefactors to the foreigner by placing in his hands the instrument with which he can produce the best building material known to man. Let us be the missionaries to introduce and give him building blocks, and when he erects his habitation it will be his shrine from which he will arise to bless the block machine makers, and I dare say we will have accomplished more good in some of these foreign climes than those who teach and force upon them some of our religions. Let him live in a hollow concrete block house and more thankfulness will pour from his heart to his Maker than through the benefit obtained by him from the exhorting missionary.

The recognition of the foreign trade, its paying results and returns finds as its greatest captains the exporters at our great seaports. New York and many other cities have them, and their great firms are numbered by the hundreds—they often receive tribute from both the buyer and the seller. They have waxed rich, and honorably so, and have obtained a foreign clientele that looks upon them, and rightfully too, as their American agents. They have sent away satisfactory goods, and one never loses a customer under such circumstances. Many of our larger manufacturing concerns, however, have saved the profits of this middleman and have established foreign branches and connections. Let me suggest right here that we get together as an association and establish a few depots in the greater European marts—each of us can have our machines on display, and an impartial person in charge to sell, or, rather, take orders. We could then unitedly and systematically carry on a block machine and block machine product propaganda, the expense in my opinion of doing all I suggest would not begin to cost what we are now as individual firms spending in foreign advertising, and once more, if I dare refer to it, the red tape would be decidedly shortened. Let us discuss this when we have the proper time. Unless we take some action we should be satisfied to pay the exporting firm a commission tribute if they secure for the business—it will pay you to get in touch with them, to write to our consuls, to send them your literature and call attention to your product; it will pay to advertise in those trade journals that make a specialty of reaching the peoples of the Orient and the Occident.

I hope I may be pardoned for digressing and giving my own company a little patting on the back, for in the past few months we have received orders from and made shipments to many European countries, among which I call to mind England, Scotland, Cuba, New Zealand, South America, Japan, Philippine Islands, Australia, even the Malay Peninsula. Block machines are an absolute necessity in the tropics, and the irrepressible Jap has the nerve and the backbone to spend money to preach among his people in his land of sunshine, flowers and happiness the gospel of concrete blocks. May success be his, may his energy be rewarded and may he succeed in teaching his people to erect habitations that will shelter them without danger even when Manana Loa, their great volcanic mountain, growls, thunders, shakes the earth in tremors and pours forth the fiery vomit of her ever-heated bowels.

For Finishing Walls

A rather novel method of finishing the outer surface of the walls of a reinforced concrete building was recently adopted in connection with a structure in Knoxville, Tenn., says The Record. The sides of the building have curtain walls of concrete brick, while the front and back walls are of monolithic construction. When the work was completed, the front elevation was treated to a cement solution applied by means of whitewash brushes. The solution consisted of water and cement of the consistency of thin grout, which was strained through cloth to remove any coarse particles that might scratch the concrete surface of the building. The coated surface was given a light and quick rubbing with carborundum bricks until a very smooth surface was obtained. The thickness of the solution prevented it from running off the wall and served as a plaster as well as a dressing. The result is a front of one color, which closely resembles limestone.

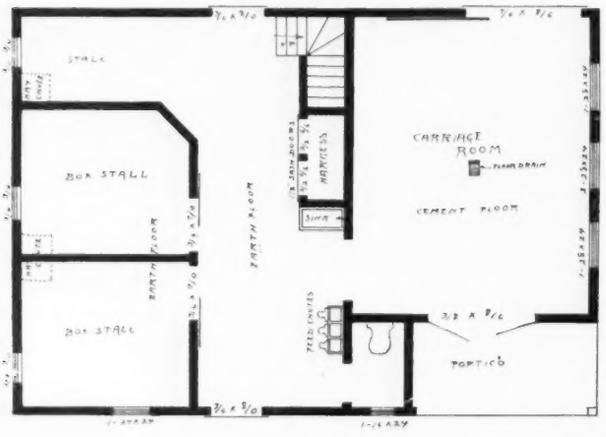
No one has a right to make others unhappy in order to please himself.

Henry H. Niemann

A Residence Barn

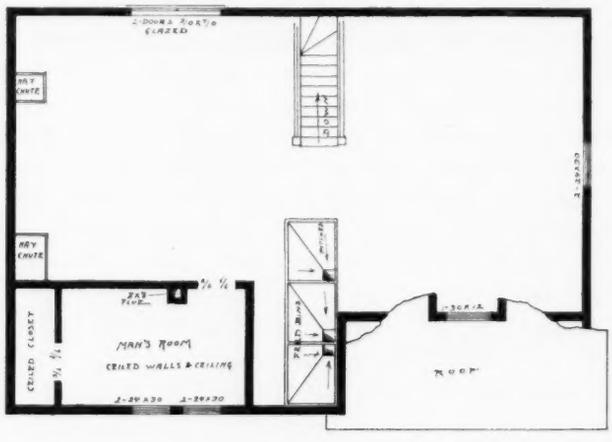
THINGS TO BE CONSIDERED IN CONSTRUCTING A BARN IN THE CITY—BEST ARRANGEMENT TO DERIVE ALL THE BENEFIT POSSIBLE FROM IT

ALTHOUGH residence barns are only intended to accommodate several carriage horses, two or three vehicles and the necessary appliances, tools, feed, etc., their arrangement is often the result of careful and complex study, because in many cases they are built to occupy a small space and often crowded in between other buildings which destroy the light and natural ventilation. Farm barns can in most cases be built to suit their interior requirements, with all windows and doors located to best advantage for the interior arrangement, but in city residence barns it is often necessary to build a straight blank wall on a side where the interior demands lots of light and air which must, however, on account of existing conditions, be switched around to some other side for better results. Often an outside door would be very convenient at a certain location to suit the interior arrangements, but would be rendered utterly useless on account of some existing exterior surroundings.



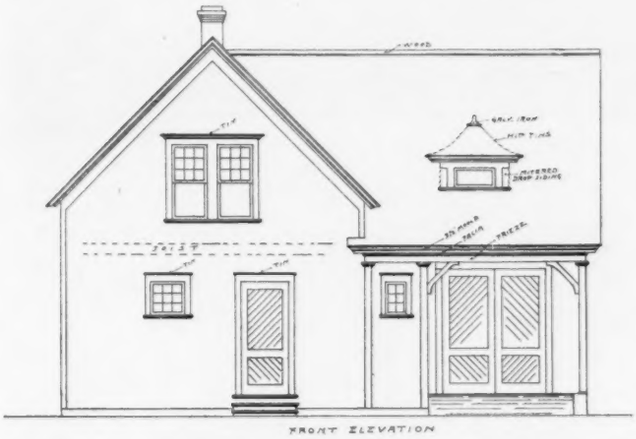
GROUND FLOOR PLAN

For these reasons it is impossible to lay down certain rules to follow in the laying out of a residence barn or to establish a design that could be called a



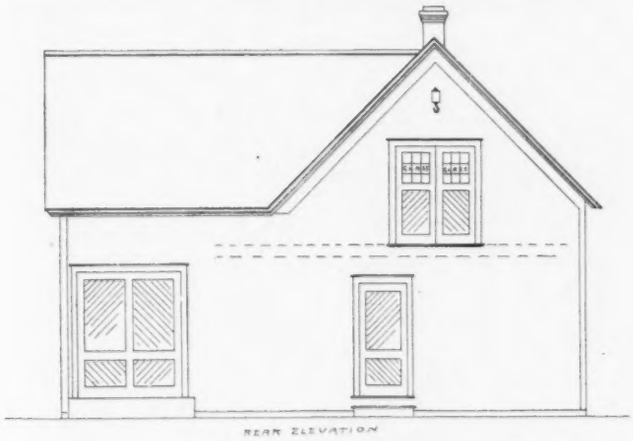
SECOND FLOOR PLAN

model or an ideal pattern, but each building must be designed by combining utility, durability and strength with careful reference to location, adding enough ar-

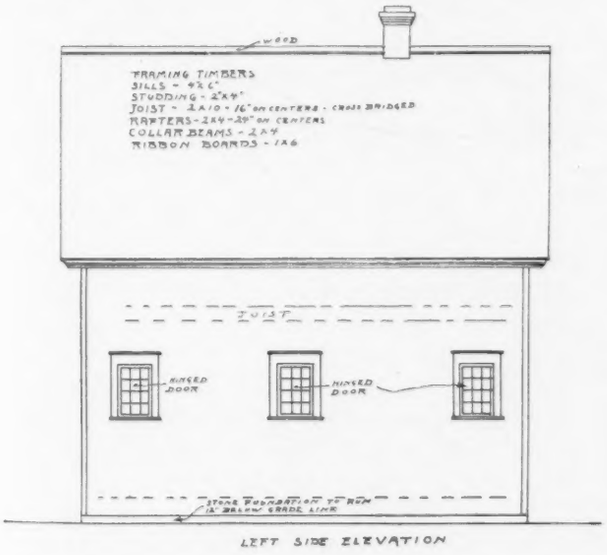


chitectural proportions to give it grace and harmony with its surroundings.

In this age of cement and concrete construction many new ideas are developed which add greatly to the



strength and durability of frame barns, one of which is hereby illustrated and consists of a concrete foundation which is built so that the inside wall surface of the concrete is flush with the inside surface of the stud-

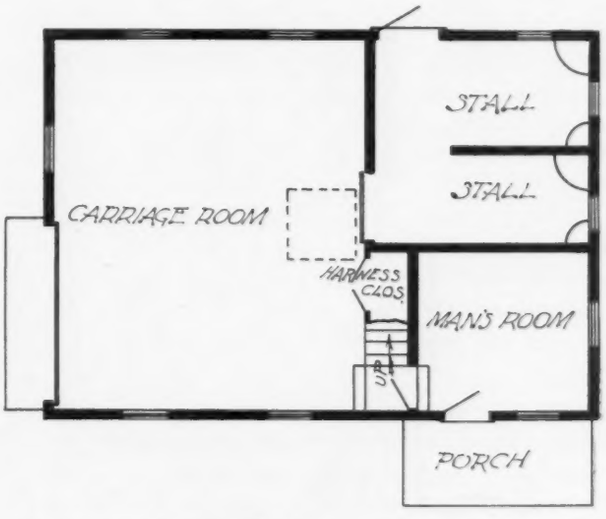


dings. This concrete wall is carried about a foot higher than the barn floor, where a double 2 inch by 4 inch plate is bedded on the concrete, bolted with anchor bolts, which are set in the concrete.

This not only forms a strong and cheap foundation, but elevates the wood work above all dampness from the barn floor and exterior grade, thus preventing the

decay of the sills and wood work.

The floor of the carriage room is of cement as this enables one to wash the carriage in the barn, and not injure the floor. There is an earth floor in the stalls,



as a cement floor would be too severe on the horses' feet.

The second floor is divided into the hay loft, feed bins and man's room.

✣

Opportunities are like eggs in that they must be hatched while they are fresh.

✣

The man who has really made good doesn't have to blow his own horn.

Edward Hurst Brown.

Painting the New House

SPECIAL FINISHES AND METHODS OF APPLYING THEM—KINDS OF MATERIAL TO USE AND WHERE MOST APPROPRIATE

IN THE previous articles we have omitted several special finishes or methods of doing work required for particular purposes, which are often necessary to know because they cannot be replaced by the methods more generally in use, and which might properly be taken up at this time.

Oil Polishing

There are certain places which are subject to a good deal of wear and tear, to an extra amount of moisture or wet or to the action of liquids, especially wines or alcoholic liquors, that more or less affect the life of varnish, or ordinary hardwood finishes. Such places are table and bar tops, sink shelves, in good houses and similar locations in kitchens and pantries. Unfortunately the average house owner is apt to consider anything good enough, when the house is being built, and is unwilling to spend the money needed for a permanent and durable finish for such places. The hotel man, on the contrary, knows the value of a polished top to his bar that will defy the hard use that such a place is given and is willing to spend the money needed to get it. For such places, there is no finish equal to the old fashioned oil polish, which is obtained by the use of linseed oil and elbow grease. This is a finish that anyone can produce, but it is so tedious and tiresome that the average journeyman dreads it, and the painter who undertakes it on any other basis than by the day is apt to find himself sadly out of pocket. But when an oil polish is properly done, it will stand hot dishes and hot liquids and the continual wetting and slops that are almost unavoidable in such places as those mentioned, and still remain in good condition. And what is more, the polish can always be renewed without any of the troublesome removal of previous coatings that is unavoidable when renewing a varnished surface.

If the surface to be polished is a new one, it should first be stained to the color desired, and then filled with a good silex paste filler that has been stained the color of the wood. When this is thoroughly dry, it is first given a coat of boiled linseed oil—although raw oil will answer—applied with a brush. Care must be taken not to use too much oil, but just about what the wood will absorb and that can be worked in by the rubber without leaving any surplus on the surface. As soon as the oil is applied, it must be rubbed in well with a rubber made by wrapping a piece of rubbing felt round a square stone, the heavier the better as the weight of the stone relieves the operator's muscles somewhat from the tediousness of the rubbing. It is impossible to rub too much, and the longer the surface is rubbed the higher the polish that will be obtained. After the first rubbing, the work should be allowed to stand for a few days and it should then be given a second rubbing. This should be repeated again and again. It takes fully six weeks to get a satisfactory result, but when it is once obtained it is superior to any other finish. It may be renewed at any time by simply sandpapering the surface smooth, touching up with stain, if required, and again oiling and polishing. If spots only require renewing, it can be done by the application of oil to those spots only, with the necessary rubbing. The process is slow and expensive, and in this country, where people are always in too much of a hurry, it is not used as much as it should be, but where hard usage is to be given there is no other finish that will take the place of oil polish.

One Coat Stain Finish

It sometimes happens that an effective finish is desired which is intended to imitate antique work and where there is no desire to produce a gloss or high finish, and at the same time the expense must be kept down to a minimum. The method given here is particularly applicable to chestnut, though it could probably be effectively used on either straight grained oak or ash. It was used by an architect in Philadelphia in finishing the interior of his own house, which was a quaint building with open beamed ceilings and large paneled wainscots. But in using it, it must be distinctly understood that it will be impossible afterward to change the finish of the wood and substitute a varnished or painted surface.

The proper color was obtained by using pure colors in oil (umber and sienna being employed in this case), and then thinning them with kerosene, with as much liquid driers as in the judgment of the painter would be necessary. Some experimenting will be needed to determine the exact quantity. The color was applied

as a paint and then thoroughly rubbed into the wood with a rag or with burlaps. The effect produced very closely approximates that of the antique chestnut that one sees in the old cathedrals and castles of Europe. The average painter will probably condemn it at once because of the use of kerosene, instead of linseed oil, but in this case the kerosene is used because it serves to carry the pigment into the pores of the wood and stains it deeply.

Scorched Finish

A remarkably effective finish was used on the white pine woodwork of a club house, several years ago, by an architect who was noted for his originality. When the wood was ready for finishing he had it scorched in places, blending from dark to light tones, using the old-fashioned charcoal paint burner. This can be moved back and forth and held closer or further from the wood, producing a great variety of shadings. In the hands of a man of some artistic judgment, very beautiful effects can be produced. To a certain extent, it is the application of the principles of pyrography on a larger scale. The use of the gasoline torch to produce the same effect is of course possible, but would require very much more care to avoid danger from fire and to keep from scorching the wood too deeply. The more intense heat generated by the torch is apt to char the surface instead of merely scorching it, and it is very difficult to produce the artistic blending of colors that can be produced by the charcoal burner. After the wood has been scorched, it is then shellacked and finished with varnish in the usual way.

The above treatment is particularly applicable for old painted woodwork that is to be replaced with a new finish specially appropriate to the Mission or Arts and Crafts styles.

Wiped Stain Effect

A method of producing unusual effects that was not elaborated under the head of stains, is specially adapted to producing striking results on white pine. The nature of this wood is such that a wiped stain of this character develops the grain and its peculiar beauty of marking in a manner that cannot be obtained by any other finish. For some reason this method of work has never obtained the popularity it deserves, partly because it departs too much from the preconceived mechanical notions of the average painter.

A thin paint is made from pure pigment colors, mixed to produce the color that may be desired, and reduced to the proper consistency with raw linseed oil, turpentine and driers. This is then applied to the wood with a brush in the ordinary manner and allowed to partially dry, when it is wiped off with a rag. This wiping has the effect of rubbing the color into the softer portions of the grain, while on the harder parts, the color is either entirely wiped off or almost entirely removed, according to the time given before wiping and the vigor with which this operation was carried on. To bring out the greatest beauty of the grain requires a workman of considerable intelligence and one who is willing to give some thought to his work. This method of staining is not well adapted to other woods.

Care of Hardwood Floors

At the recent convention of the Master Painters' Association of Ohio, it was brought out that most house owners expect a great deal more from a hardwood floor than ought reasonably to be required from it. Varnish or wax finish is condemned because it will not stand wear and tear that would wear away a carpet or even the wood itself. In one case the varnish used on a staircase in a public building was condemned because it wore away so soon, and when the work was examined by an expert it was found that the traffic on that staircase was so severe that not only the varnish was worn away, but the woodwork of the stairs was worn down by the constant friction with heavy shoes. It is practically impossible to produce any finish that will stand without frequent renewal upon any floor that is in constant use. Take, for example, the portion of the dining room floor which is directly in front of the door leading to the kitchen or the pantry, the floor of a hallway where the traffic is along a straight line, or along the aisles of a school room or a church. If the floor is carpeted, it will wear out much faster in such places, and it is unreasonable to expect a varnish or wax finish to last as long as the more elastic surface of a carpet. The sales manager of a prominent varnish manufacturer said that he had contended for many years that varnished floors were not meant to be walked on, but should be protected by rugs or strips of carpet laid down upon those portions where the wear is apt to come. By properly protecting them in this manner and by wiping them clean every day, you have a clean and sanitary floor. The rugs or other coverings should be shaken at frequent intervals, in that way preventing the accumulations of dust or disease germs. Even a brick or stone pavement will wear away if used constantly and surely as much cannot be expected from shellac or varnish as would be looked for from these materials.

Another great cause of the failure of varnished or painted floors is the character of the soap that is used. The ordinary laundry or kitchen soap is full of alkali that is very destructive to varnish or paint and the washing powders that are so much used and so largely advertised are almost as effective in taking the finish off as some of the paint and varnish removers. The only kind of soap that should ever be used on a varnished floor, or indeed on any varnished surface, is a neutral linseed oil soap, such as is used in cleaning railroad cars or fine carriages. Such a soap is expensive and it may take a little more elbow grease to remove the dirt, but it is not nearly so destructive to the varnish as the ordinary soaps. The best method is to use warm water only, for washing a floor, and to wipe it off occasionally with crude petroleum or with rubbing and polishing oil, applied by means of a cloth slightly dampened with the oil, and then wiping the

surface dry with a clean rag. This will keep a floor in good condition for years. The use of ordinary kitchen soaps, washing powders and of sand soaps—even though they may be advertised that they do not scratch—is to be avoided on all painted or varnished surfaces. If builders would make it a point to caution housewives on these matters, they would avoid much trouble for themselves in the future, and could meet complaints about paint or varnish perishing, by asking the question if it had been washed with soap. An affirmative answer could be met with the response: "I cautioned you not to do it, because soap is a paint destroyer."

Painting Cement

The following method of painting a cement wall was described at a recent convention of master painters. The building had become discolored in places and the joints were of a different color from the surface of the blocks. Two parts of Portland cement were mixed with one part of marble dust and mixed with water to the consistency of thin paint or a thick whitewash. The wall must be well wetted before the application of this paint and kept constantly wet while the material is applied, and then must be kept wet for a day longer, in order to make the cement wash adhere to the cement surface. The wash was applied with ordinary whitewash or calcimine brushes, and a man was kept busy playing a hose on it while the work was being done. The whole secret of success lay in keeping the wall constantly wet. A price could not well be quoted on such work, but on a scaffolding job, it should be worth not less than a dollar a yard.

A well-known painter, who is one of the largest contractors in the country, in commenting on this, said that he had frequently been called upon to paint the cement panels in half-timbered houses, and the best material he could find for the purpose was an English material known as Duresco. This comes in paste form and is thinned with water to the consistency of thin cream and to this a little of a so-called "petrifying liquid" made by the manufacturers is added. This material is the same color when it is wet as when it is dry—differing from ordinary water paints in this respect. It can also be used on pressed brick fronts. The results are said to be as durable as oil paint, without the gloss of that material, and consequently well adapted for painting cement work. The same material is sold in this country under the name of Onresco.

✣

A big cottonwood tree recently cut near Greenville, Miss., measured 108 inches across the stump and contained 4,800 feet of lumber.

✣

A great injustice is often done ability by its confinement to a condition which affords no scope for development.

Making a Red Gum Desk

(*Continued from page* 792.)

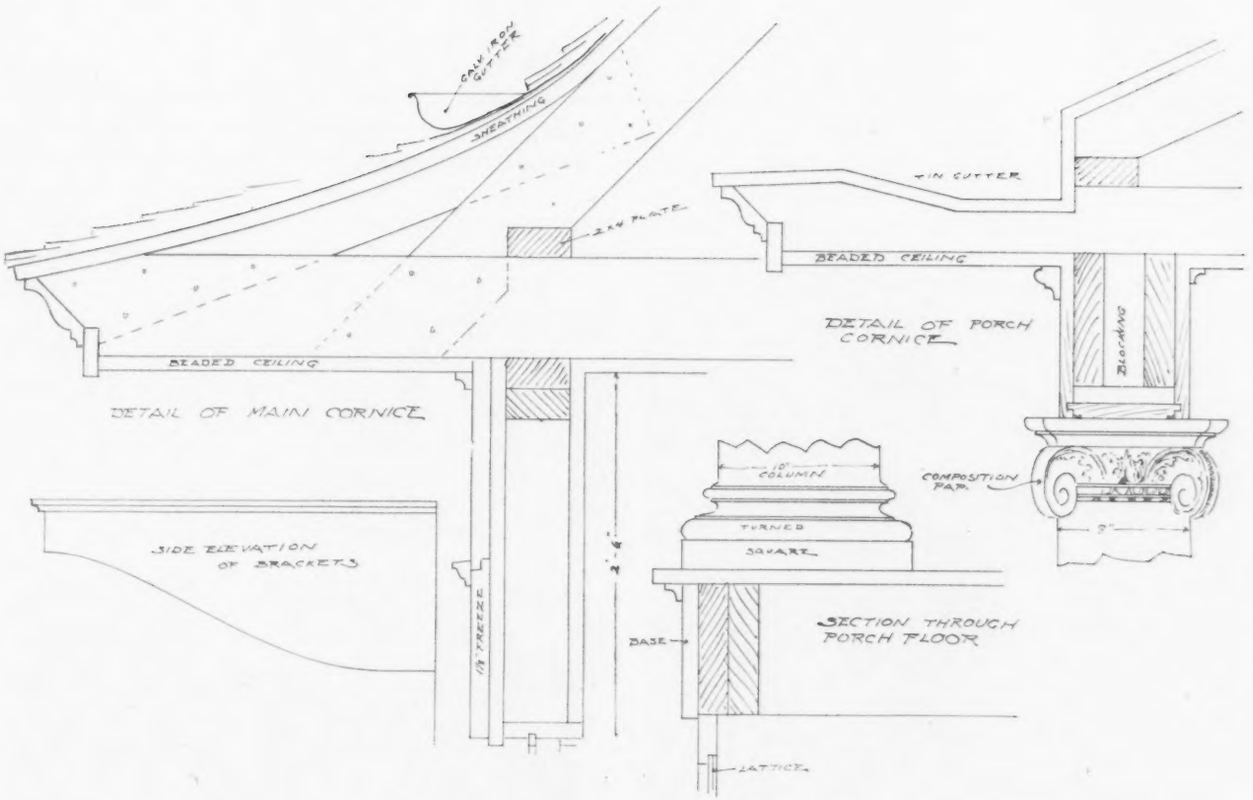
was worth looking at, and to improve the tone just a little more I took a little polishing oil of the kind they sell for renewing polish on furniture and gave the finishing touches by rubbing this oil on and rubbing it off again with a clean soft cloth. As a result there is a polish on the desk that it is a pleasure to look at. It doesn't glare at you like some loud, noisy thing, but has a refined tone softened materially by the nut brown color of the wood, and the polished surface of the top is good enough that you can see yourself in it, and yet it has that subdued tone that makes it wear well on one's nerves.

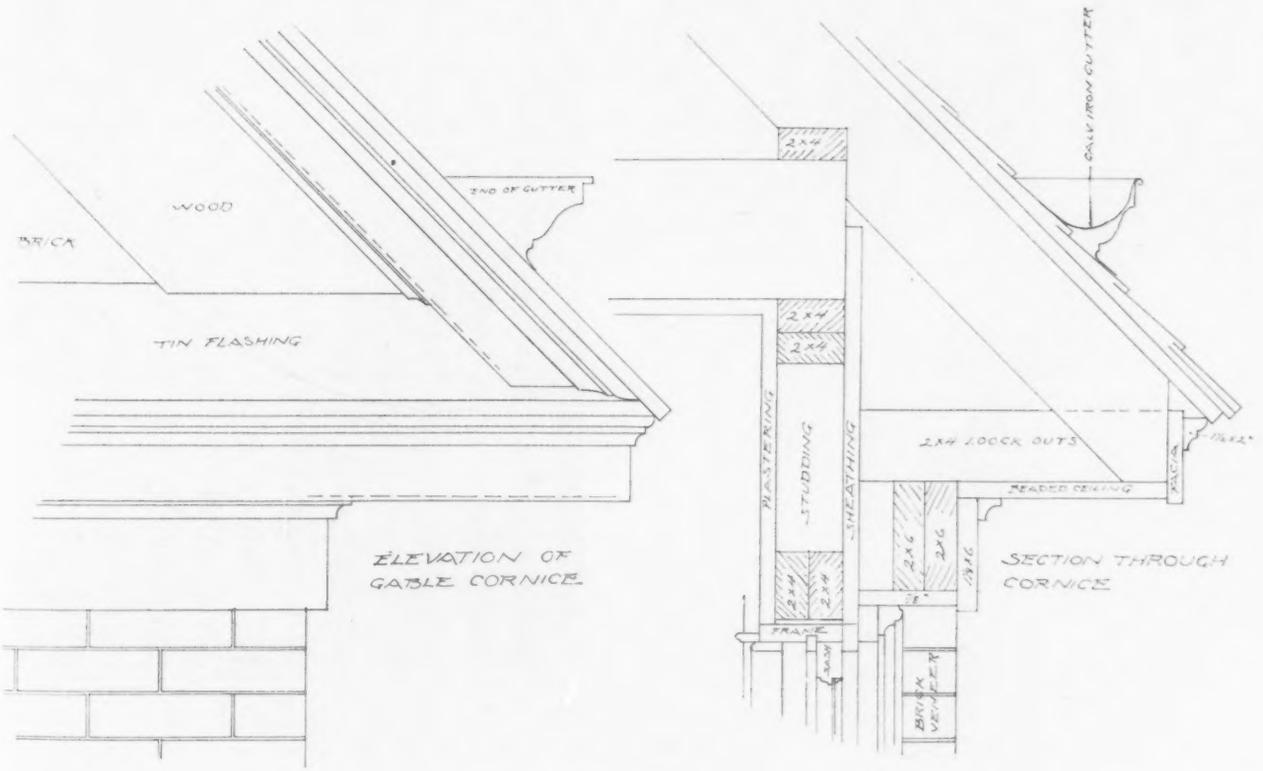
The great feature about it all is not in the workmanship, for it is a job of work any man competent to handle tools can do by having patience, but it is in the demonstration of the fact that red gum not only takes finish well, but shows up a beautiful figure in its natural color, and if properly put together will give excellent satisfaction in cabinet or furniture work. We have been using gum extensively especially in furniture, but it is because of its cheapness and no one seems to properly appreciate its beauties. It seems difficult to the average mind to separate the idea of value from dollars and cents that a thing costs even though that value may have relation purely to the ability of the thing to please the eye. If this lumber were imported and cost $150.00 per thousand feet, we would all long ago have raved over its beauties, but because it is plentiful in our native forests and among the cheapest of our woods, it wastes a lot of its beauty unseen. All gum does not show a beautiful figure, nor have an appealing tone, but the Southern red gum from Mississippi and Arkansas and down in that part of the country does furnish some lumber that needs more appreciation than it gets. You need not take my word for it, but go to some factory using Southern gum, select a few good boards to make something for yourself, take the same pains as you would with mahogany, and you will be pleased with it yourself.

✣

Colossal Old Ruins

The oldest architectural ruins in the world are believed to be the rock temples at Ipsampool, on the Nile in Nubia. One of the ancient temples consists of fourteen apartments hewn out of solid stone. The largest single stone used in this work is one which forms a veranda-like projection along one side of the main temple. It is 57 feet long, 52 broad and 17—one account says 19—feet thick. This colossal stone is supported by two rows of massive square pillars, four in each row and each 30 feet high. To each of these pillars is attached a colossal figure of a human being, reaching from floor to roof. In front of the main temple are seated still other colossi, four in number, the two largest being 65 feet high. The ruins are supposed to be four thousand years old.


GALV. IRON GUTTER
SHEATHING
2x4 PLATE
TIN GUTTER
BEADED CEILING
DETAIL OF PORCH CORNICE
BLOCKING
BEADED CEILING
DETAIL OF MAIN CORNICE
10" COLUMN
COMPOSITION PAT.
TURNED
SQUARE
SIDE ELEVATION OF BRACKETS
1/8" FREZE
2'-6"
BASE
SECTION THROUGH PORCH FLOOR
LATTICE


WOOD
BRICK
END OF GUTTER
TIN FLASHING
ELEVATION OF GABLE CORNICE
2x4
2x4
2x4
PLASTERING
STUDDING
SHEATHING
2x4 LOOCK OUTS
BEADED CEILING
2x6
2x6
FRAME
BRICK VENEER
GALV. IRON GUTTER
SECTION THROUGH CORNICE

Modern Picture Friezes

PICTORIAL FRIEZE AN IMPORTANT FACTOR IN ORIGINAL DECORATIONS—COLOR SCHEMES TO USE FOR THE DIFFERENT ROOMS

By Sidney Phillips

ONLY a few years ago, practically all the wall papers manufactured in this country, as well as most of those imported from England, France or Germany, were made in what were known to the trade as "combinations," that is sidewall, ceiling

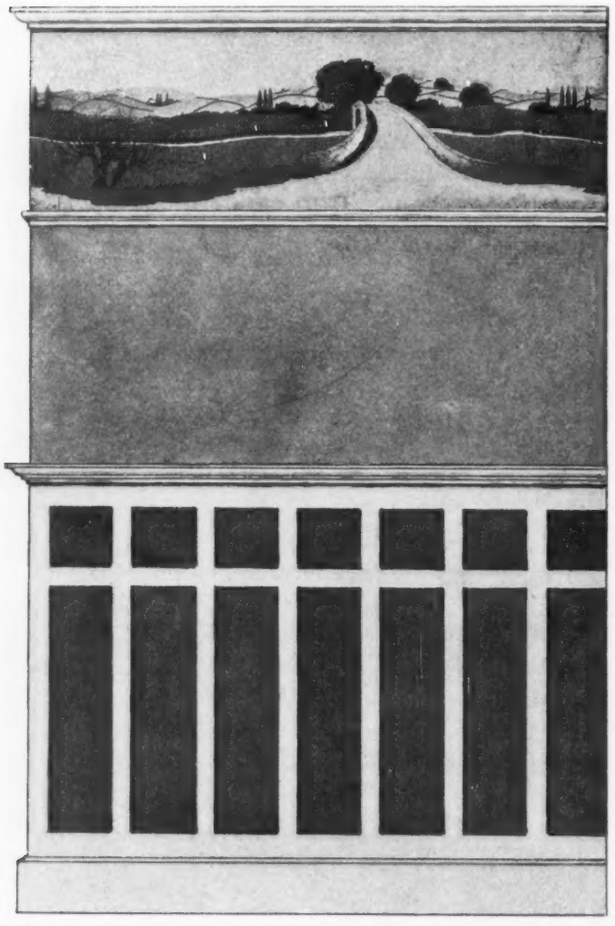


FIG. 1

and frieze or border papers were made to match, or they were so designed that the motive or idea appeared in each of the three papers. The floral or conventional treatments almost invariably being adopted. The retail dealer was expected to buy "combinations," and in fact some manufacturers and jobbers refused to book orders for sidewall paper unless the proper proportion of frieze was included. The reason for this was that competition was very keen, among the manufacturers as well as among the retail dealers, and in an effort to get business, often absurdly low prices were quoted on the "sidewall" papers—frequently below the cost of production. To make themselves even, much higher prices were charged for borders, so that orders for full combinations yielded the manufacturer a profit on the total sale, though he might lose money on the sidewall. The retail dealers and decorators, in town, would quote cut prices on paper by the roll, and often unsuspecting property owners would select a certain combination and have it hung. He would find that when it came to the border, he was charged by the yard. Any criticism was met by the reply that this was the regular trade custom, and it was not difficult to prove that this was the case. Indeed, even now when "combinations" are not so universally used, it is still customary to charge for friezes by the yard and for sidewalls and ceilings by the roll.

Several years ago, people began to adopt the English fashion, especially in rooms with low ceilings, of using a sidewall paper without frieze, running it from the ceiling angle, where the joint with the ceiling paper was usually hidden by a picture moulding, without a break to the baseboard. The manufacturers finding a demand for papers that were particularly adapted for

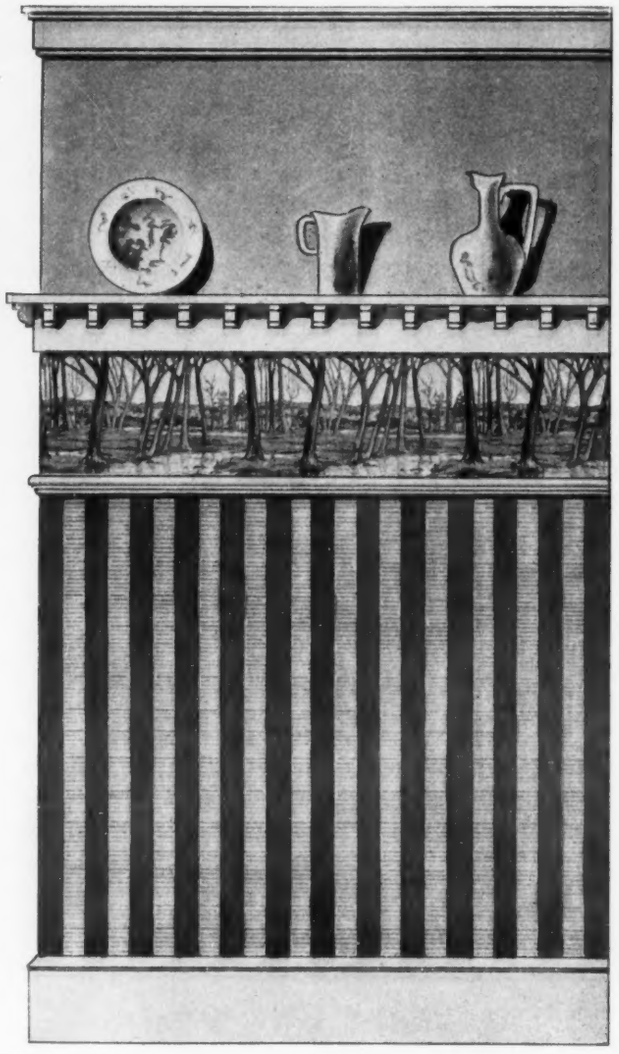


FIG. 2

this treatment have brought out each year, an increasing number of "independent" side wall and ceiling papers. Many of these are designed with regard to what is known as the two-thirds treatment, in which the upper third and the lower two-thirds of the wall are hung with two entirely different wall papers, selected not because the same motive occurs in their designs, but because they give a pleasing harmony or agreeable style.

Once the manufacturers were willing to break away from "combinations"—and they did so because the decorators began to turn toward the imported papers in order to get what they wanted, for English wall paper manufacturers are always quick to respond to their customers' wishes—the decorators began to adopt more originality in hanging wall papers, and to use panel effects and the like, and the manufacturers have produced many original ideas in borders for paneling and similar purposes. Finally they began to introduce independent friezes. Now there is no part of the wall that is more suitable for a certain richness and elaboration in decoration than the frieze. It is not cut into by furniture or hidden by pictures, and except where ceilings are low it runs above the tops of doors and often of windows too. In the older buildings, where painted walls were the rule, eminent artists were often engaged to paint the friezes, especially in public buildings, and such friezes were almost always given a pictorial character. For example, there is the celebrated "Frieze of the Prophets," in the Boston Public Library, a noble work of the greatest artistic value. It was but natural then, that in offering independent friezes to the public that the idea of a pictorial frieze should occur to some enterprising manufacturer. The first of this character, so far as we know, were of English make, and great numbers of pictorial friezes are brought out by the leading English manufacturers every year. Our American manufacturers followed the example of their English cousins, and in some respects have improved upon their offering and pictorial friezes have been produced that are truly remarkable in their capabilities in the hands of a skillful decorator. For example a landscape frieze has been shown this season that varies continuously, so that it may be run round an entire room without a single repetition of the pattern. This is done by a peculiar process of double printing by which the trees in the foreground are printed with a different length of repeat from the mountains and distant plains that form the background; probably being printed from rolls or cylinders of different diameters, and although the foreground trees occur regularly at intervals of six or eight feet, they are never seen twice against the same background in any ordinary room, hence the

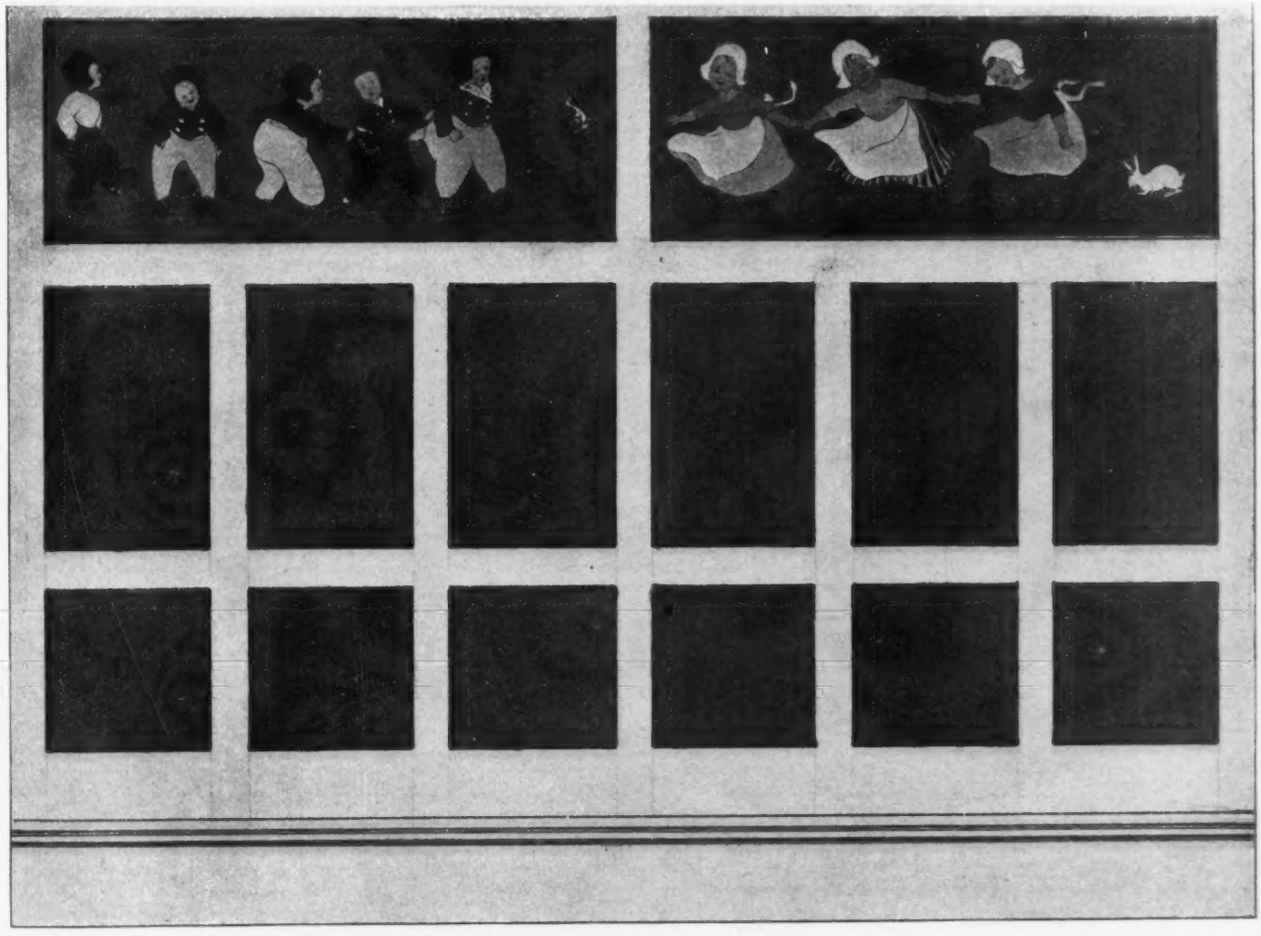


FIG. 3

repetition would be unnoticed. Another device for giving a continuous pictorial effect is the so-called "elastic" frieze, which is practically a combination of two or more designs or patterns. One of these will give, for example a woodland scene, with deer chased by dogs, while the other section will be a continuous forest pattern. A single repeat of the first may be used in the center of the wall, or over the chimney breast, while the remaining space on either side is filled up with the extension pattern. Sometimes there are

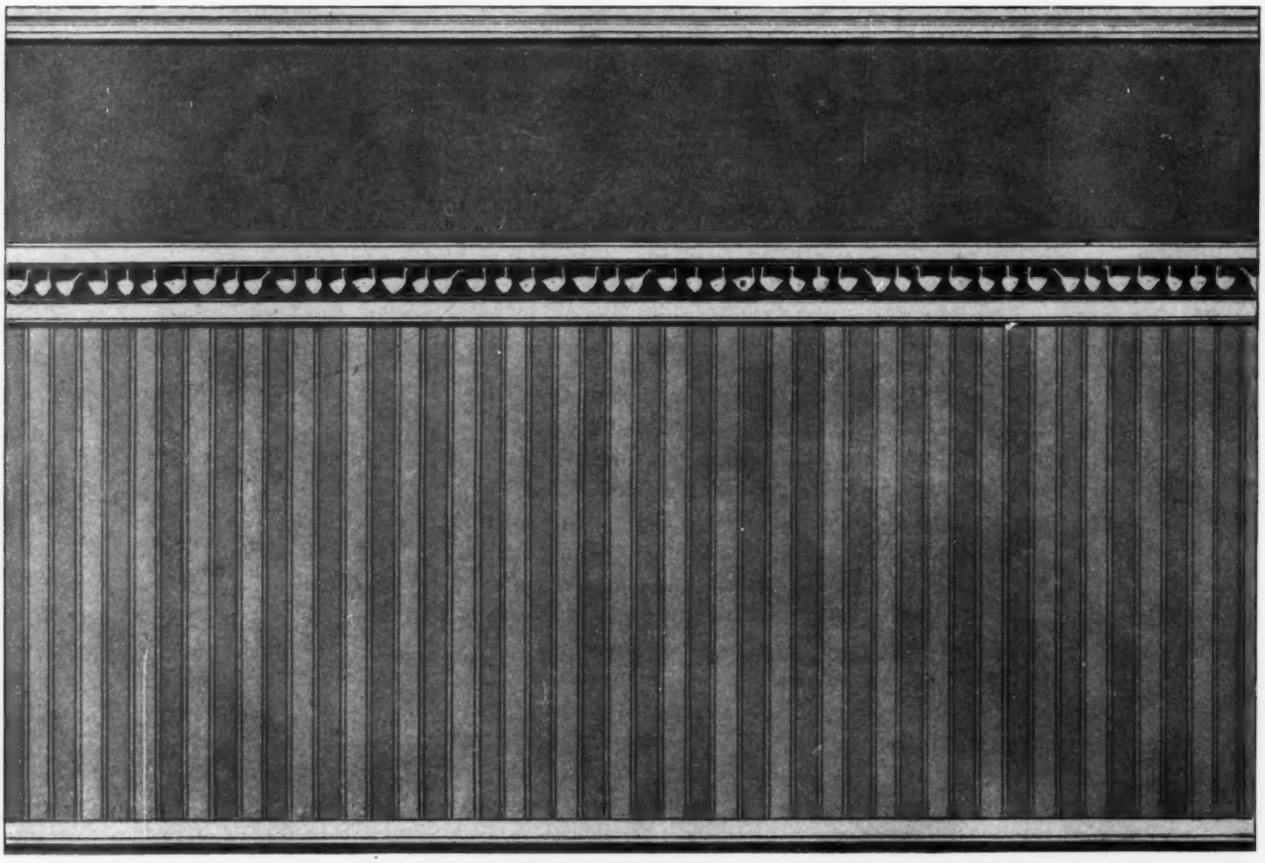


FIG. 4.

from two to four different central sections all matching up with the same extension, so that each side of the room may be differently treated, giving all the effectiveness of a specially painted frieze. One magnificent hand print that was put on the market last year showed the sport of archery, in four different phases, the figures being dressed in quaint mediaeval costumes. Other frieze patterns have been made that are capable, not only of this extension, but that may be trimmed down to varying widths by cutting off a porion of the foreground or of the sky. One firm has made a specialty of friezes and has introduced an entirely new treatment. Their patterns average about thirty feet in length, made up of several sections, each one about five feet long. They are so designed that they can be matched together in any combination or arrangement desired—in other words, the order of arrangement of these sections is not fixed, but is left to the decorator. One section of each set is elastic, and so designed that any length desired can be cut from the middle of the section, and the two side edges when brought together will produce a perfect match. These friezes include Dutch landscapes, barnyard scenes, a remarkably fine Indian picture with distant mountains and many other pictorial designs that are broad in treatment and very decorative.

Of course the original idea of these pictorial papers was that they should be used as friezes, at the top of the wall, but with the desire for originality in decoration, other uses have been found for them and many novel ideas have been developed. We will illustrate a few possibilities, more with the idea of suggestion than anything else.

First let us consider the normal use, with the border used as a frieze; a fine English paper being chosen to illustrate the idea. The treatment shown in Fig. 1 would be well adapted for a dining room or hall. The picture is naturally the key note of the color scheme, and as this is painted in a number of different colorings the room will be varied according to the one selected. We will choose, for example, a picture printed in soft browns and greens, with a gray sky. The wall immediately below may either be brown or green, of harmonizing shade while the dado panels may be filled in with burlap of a much darker tone of the same color. The side wall may be either a plain ingrain paper or one of those indistinct fabric effects that are so effective.

The next suggestion shown in Fig. 2, introduces the idea of a pictorial border capping a high dado, with

plain upper wall, serving as a background for the objects displayed on a bric-a-brac shelf. Here we have used a beautiful woodland frieze, made by a well known American manufacturer for the coming season's trade. This is particularly pleasing in a soft gray coloring. Using this as the key, we will hang the upper wall with a plain gray ingrain paper or a silver gray buckram, while the dado will be hung with a two-toned stripe in a gray green, using either a grass cloth or fabric effect of some kind.

The third suggestion (Fig. 3) makes use of some imported nursery panels, printed in poster effects on plain ingrain grounds. Let us choose a dark green coloring, and set these pictures in the upper panels of a wainscot, the lower panels of which are filled in with dark green painted and varnished burlap. The upper wall is a two-toned stripe in lighter shades of green, or a clothy pattern might be used. Then comes a broad moulding with a row of geese stenciled on it against a band of bright red. A plain color red or green, is used for the frieze section. A somewhat similar treatment might be adopted for a den, using some of the English poster effects, sporting or coaching frieze.

The illustrations, as we have said, are mere suggestions and show the possibilities for artistic and original decoration that may be found in the use of these modern pictorial friezes. They are made in a great variety of widths from nine inches up to thirty or even more, and in all classes of design, from quaint poster effects to classic figures and from flowers to the most elaborate landscapes. The decorator who uses good judgment cannot fail to find something suitable for the particular room to be treated.

Some Frost Problems

WHAT MUST BE CONTENDED WITH IN COLD CLIMATES—METHODS USED TO OVERCOME THIS DIFFICULTY—PRACTICAL ILLUSTRATIONS OF THE EFFECT OF FROST

By T. B. Kidner

THE difficulties attendant on the erection of brick, stone and concrete structures during cold weather are well known, and certain precautions are very generally adopted to prevent failure of the work from the freezing of the mortar or other cementing material during the progress of the construction.

But it may not be generally known, at least among

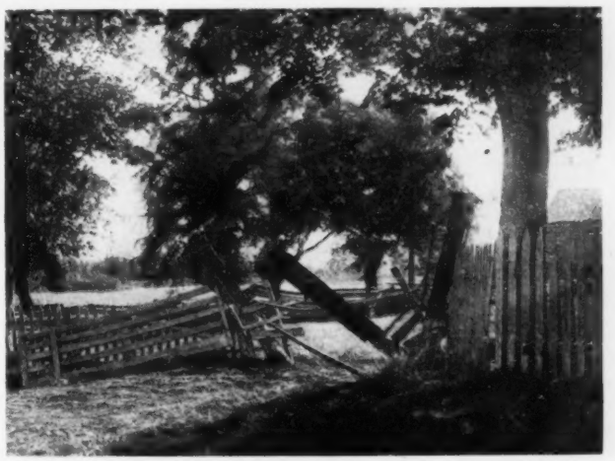


FIG. 1.

the Southern readers of the "American Carpenter and Builder," that in the colder portions of North America the intense cold plays curious pranks with some forms of wooden structures, and offers some problems for the engineer and carpenter which are of some interest.

The expansive power of frozen water is well known, and has been used, experimentally at least, in some heavy quarrying operations. This property of water of increasing in bulk when frozen is responsible for some curious and annoying occurrences, examples of which are common everywhere throughout the more frigid portions of the United States and Canada.

Fig. 1 of the illustrations shows an entrance gateway to a farm in New Brunswick, Canada. It will be seen that the posts are lying in various attitudes, one being almost prone on the ground. Less than three years ago the owner of the farm erected these posts, burying them four and a half feet in the ground, and well ramming the earth and stones around them. Their present position is entirely the result of the lifting action of the frost, which in this part of the continent penetrates the ground generally to a depth of four or five feet, and an even greater distance in exposed situations. Water finds its way down the sides of the post during the autumn and saturates the earth under its bottom. The heavy frosts follow and expand this water-charged earth, the effect being to lift the post sometimes as much as eight or ten inches in a single winter.

Fig. 2 is a photograph of another instance of this power of frost, and is perhaps even more curious

FIG. 2.

than the other case. The structure shown in the photo is a rough woodshed, abutting at one end

against a dwelling-house, and at the other against a substantial barn or coachhouse.

The house and barn were properly constructed with sills and foundation walls, but the woodshed was erected on a number of cedar posts, placed upright at intervals, their butts being buried several feet in the ground. Some ten heavy winters, the temperature sometimes going as low at 40 degrees (F.) below zero, have produced the curious "hog's back" arrangement shown in the photo at the ridge and eaves of the woodshed. The ends of the ridges, being fixed to the house and barn respectively, did not move, but the middle portion, carried on the posts stuck into the ground, has been gradually lifted up as shown. During the last winter the writer made some measurements and found that, approximately, the ridge had been raised some two inches between December, 1905, and May, 1906.

What remedies or precautions, then, may be adopted to prevent this sort of thing?

In the case of a structure like the woodshed the remedy is obvious, namely, to put proper sills under the building in the first place, framing the building into and upon them.

But it is not such a simple matter in the case of isolated posts, although two or three methods are in use. A friend of the writer, a railroad engineer of long experience in cold climates, adopts the plan of pointing the lower ends of all fence posts used alongside his railroad tracks. This appears to have but a slight effect in preventing the rising of the posts, but it enables the section men to drive the posts down into the earth again when the frost has disappeared in the spring. Of course, in an open soil which drains itself, the lifting is very slight, but in close marl or clayey soil, every post will have risen from four to eight inches in a heavy winter.

Telegraph and telephone poles are always, where it is practicable, sunk below the frost line. Where this is not possible a good bed of stone is placed at the bottom of the excavation to provide a drainage for the water.

There may be among the many readers of this journal in the Northern states and Canada some persons who may be able to give their experiences along this line, and to add something to the foregoing remarks. If so, the writer trusts that they will communicate their views for the benefit of himself and other readers, many of whom must have been confronted with the difficulties mentioned.

The Ideal Concrete Machinery Co., of South Bend, Ind., has just secured an order for a carload of Ideal Hollow Concrete Block machines, to be sent to the City of Mexico.

Among the many fine exhibits at the Michigan State Fair held at Detroit, Mich., were those of the Grand Rapids Plaster Co., of Grand Rapids, Mich., who had an entire house constructed of Sackett's Plaster Board.

The Concrete Machinery Co., of Jackson, Mich., had one of the largest and most complete exhibits. They displayed their block machine, brick machine, mixer and ornamental molds. Mr. Sid L. Wiltse was so busy demonstrating the fine points of the various machines that he barely had time to watch the horse races, which speaks well for his self-control.

The Detroit White Lead Works, Detroit, Mich., have an excellent system of having the various department heads meet informally once a week when all topics of interest to the company are discussed. This results in a co-operation of all the departments, which otherwise could not be obtained.

One of the best equipped plants in the country is that of the Acme White Lead Works, Detroit, Mich. The grounds are kept in splendid condition and several tennis courts are kept up for the use of the employes.

The J. A. Fay and Egan Co., Cincinnati, Ohio, has given the sale of its machines to Herron, Richard and McCone in San Francisco, Cal. E. C. Eckstein is their new agent in the Railway Exchange Building, in Chicago.

Among the exhibitors at the Ohio State Fair, held at Columbus, Ohio, were the Winget Concrete Machinery Co., Jaeger Machine Co., Francisco Adjustable Block Machine Co., International F. and Fireproofing Co., and the Blakeslee Concrete Machine Co. Messrs. Frederick and Green of the Blakeslee Concrete Machine Co. must have winning ways and a good machine, for they had a crowd around their exhibit in spite of the airship which was circling in the air.

The Edwards Manufacturing Co., Cincinnati, Ohio, has just put in a new power break machine for making metal windows. It weighs 28,000 lbs., and makes nine bends in the sheet metal at one operation.

The Harmon S. Palmer Building Block Co., of Washington, D. C., who recently purchased the Cement Machinery Mfg. Co., Burlington, Iowa, has just purchased the Winget Concrete Machine Co., Columbus, Ohio. The new company will be known as the United Concrete Machinery Co., and is capitalized for $1,000,000, of which Harmon S. Palmer has controlling interest.

The man who trusts solely to brute strength to see him through the world must naturally expect to get a little brutal treatment now and then.

The boat built to carry another man's cargo may capsize under yours.

Something the Boys Can Make

HOW TO CONSTRUCT A SIX AND EIGHT SIDED TABOURET—KINDS OF WOOD TO USE AND PROPER FINISH TO GIVE THEM

AN extremely simple piece of furniture construction is that of the tabourets shown this month. Two styles are described; one of eight sides with four legs, and one of six sides with three legs. The square butt joint fastened by means of lag screws is used on each one.

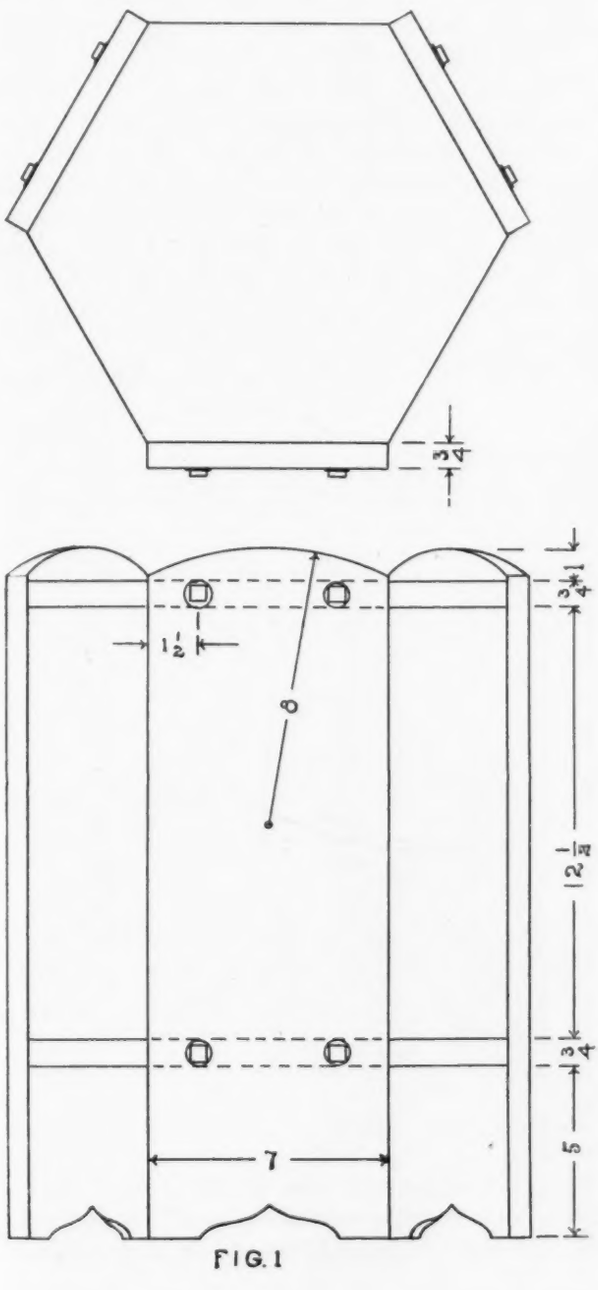


FIG. 1

For the hexagonal, or six sided tabouret, Fig. 1., two pieces each twelve and one-half inches in width by fourteen and one-half inches in length well planed to three-quarters of an inch in thickness will be needed out of which to make the top and the shelf. Oak will answer nicely. Plane the surface and scrape them with the steel-scraper until they are smooth.

The legs will require three pieces of three-quarter inch mill-planed oak, seven and one-half inches wide by twenty and one-half inches long. Plane off the marks using the smooth plane set very shallow.

Fig. 2 shows the manner of constructing the hexagon. Unless the top and shelf are alike there will be trouble when the legs are attached. The greatest care, therefore, should be taken in laying out the hexagons as the slightest variation in placing the divided points will make sides of different lengths.

Find the center of the board by drawing the diagonals; that is, the lines from corner to opposite corner. The point of crossing of the lines gives the center. Set the dividers to seven inches between the points and describe a circle using the center of the board as the center of the circle.

It will be found impossible to get the entire circle on the board, the board being but twelve and one-half inches wide while the circle has a diameter of fourteen inches. This will make no difference.

Draw a line parallel to the edge of the board passing through the center. Using the seven-inch radius, set one point of the dividers successively, at the points this line cuts the circle and cut the circle on each side of the straight line. Fig. 2 connects the six points of the circle and the hexagon is completed.

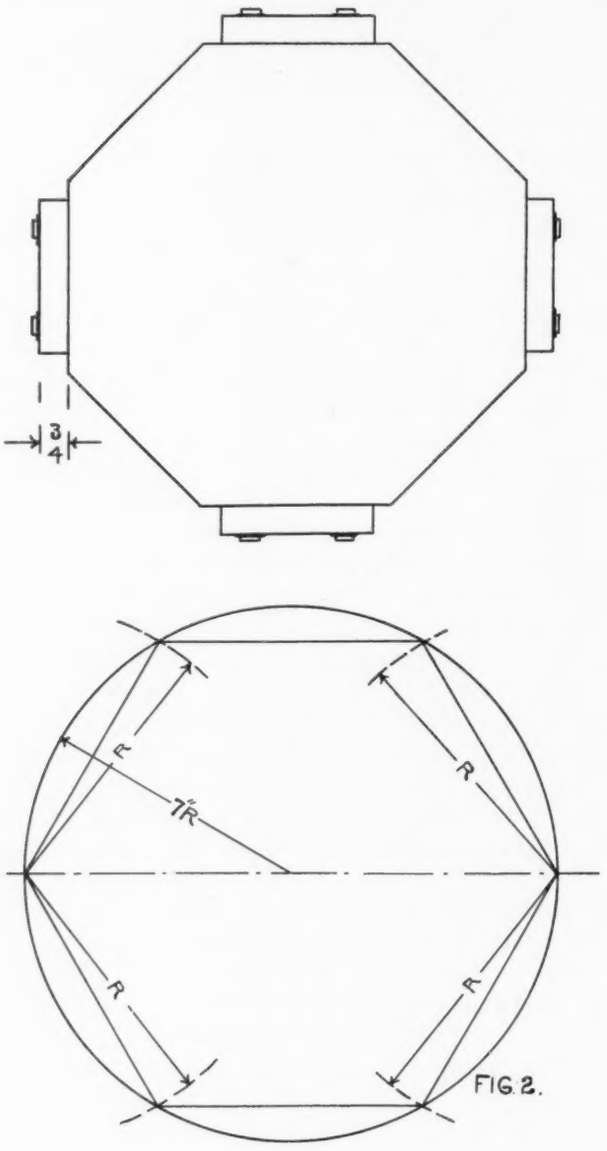
To test the accuracy of the construction, take the dividers and see if the sides of the hexagon are of equal length and each equal to the radius of the circle.

Saw close to the lines and plane the edges smooth and square. Watch in both planing and sawing that the tools are not worked against the grain of the wood. Where the edge to be planed is at an angle to the grain, plane in the general direction of the grain.

Prepare the legs by straightening and squaring up one edge of each, then gauge to seven inches and plane the remaining edges.

The top end is rounded. Find the middle of the

leg, drawing a light pencil line along it about eight inches from the top. Set the dividers to an eight-inch radius and, with one point almost touching the top of



the leg and the other on the center line, describe an arc of a circle.

The bottom of the leg is laid out by measuring from the highest point of the arc at the top of the leg twenty inches, squaring across with trysquare and pencil. Saw off along this line and plane smooth and square.

Suggestions for designs suitable for the bottom of the legs will be found in last months' journal in the description of the making of a piano bench.

The holes at the bottom of the legs through which the lag-screws enter are laid off by measuring from the bottom five and three-eighths inches and squaring a light pencil line across. On this line measure one and one-half inches from each edge. The intersections give the center of the holes.

For those at the top of the leg measure one and three-eighths inches from the top of the curve and square a light line across. Measure from each edge along this line one and one-half inches. Bore the holes with a one-quarter of an inch bit.

Sandpaper all of the pieces well and give them a coat of filler. Directions for the use of filler will be found upon the can.

If a dark finish is desired, it will be necessary to stain the wood, allowing it to dry thoroughly, before applying the filler. It is much easier to stain and fill the wood before the pieces are fastened together and the result is more satisfactory.

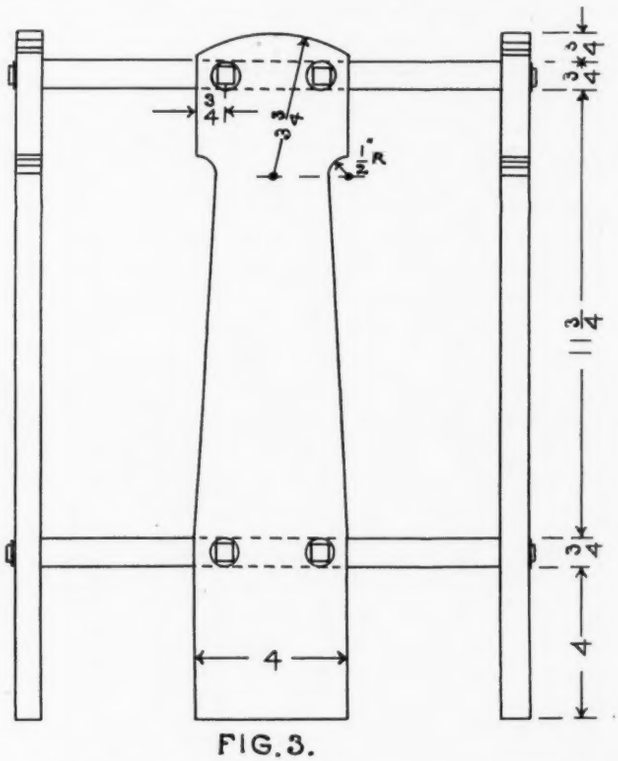
In assembling the parts, place a leg in position with reference to the top and mark through the holes with a divider point. Take away the leg and with ruler measure so as to locate the hole in the middle of the edge of the top. Bore these holes with a three-sixteenths of an inch bit to a depth of about two inches.

Next locate and bore the holes in the shelf. It will be found just as convenient and will save time to fasten each leg in place as soon as the holes in the shelves are bored rather than to mark and bore all the holes before placing any.

Apply two coats of wax, polish in the usual manner and the tabouret may be considered finished.

The eight sided tabouret, Fig. 3, will require two pieces twelve and one-half by twelve and one-half inches for the top and shelf; and four pieces four and one-half by eighteen and one-half inches for the legs. Three-quarter inch mill planed oak is to be used. Prepare the surface as described for the first tabouret.

The top and shelf may now be laid out. Square up in the usual manner the two pieces to twelve by twelve



inches. Draw light lines from corner to opposite corner to locate at the center, Fig. 4. Next set the dividers so that the distance between the points shall be

equal to one-half that of the diagonal; or equal to the distance from the center of the square to one of its corners. Set successively one point of the dividers on each corner of the square and with the other cut the sides of the square. Connect the points at which

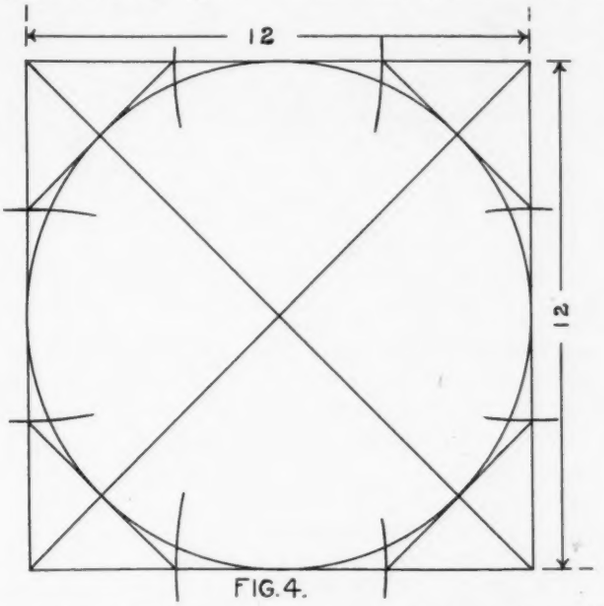


FIG. 4.

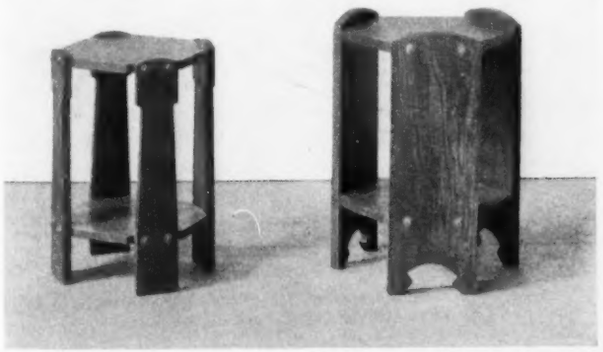
the sides of the square were cut and the octagon is formed.

The circle, Fig. 4, suggests another way in which tangents to an incribed circle complete the sides of the octagon.

For the legs, plane one edge of each straight and square; gauge to four inches and plane the remaining edge to these gauge lines.

Having located the middle of the leg with a straight line near the top, set the dividers to three and three-quarter inches and with one point on this center line describe an arc of a circle which shall reach almost to the end of the piece.

From the top of this arc, measure eighteen inches and square a line across for the bottom of the leg.



To lay out the sides of the leg, measure from the bottom four and three-quarter inches and square a light pencil line across the face. At the top of the leg square another light line across at the point from which the arc at the top of the leg was described. Set the dividers to one-half an inch radius and with one leg of it centered on the intersection of the pencil line last drawn and the edge of the leg describe an arc of a circle on each of the sides successively. Connect these arcs by straight lines to the points where the light pencil line squared across three and three-quarter inches from the bottom intersects the edges of the leg.

Cut out the curves with the turning saw and the straight lines with rip or cross cut saws. Smooth with spokeshave and scrape.

The staining, filling and finishing is to be done as described for the preceding tabouret. The parts also are assembled in a similar manner, lag screws one-quarter by two and one-quarter inches being used in each case.

✤

Woods of New South Wales

It is said that the forests of New South Wales have an abundant supply of woods which are so varied in nature as to supply practically the requirements of the markets of the world. The hardwoods especially are said by experts to be particularly valuable. The colony engages to a considerable extent in the exportation of its forest products, which may be taken as proof of the foregoing statements.

A wood which has lately aroused a great deal of comment is mountain ash, which is admirably adapted for the making of handles, for wagon and carriage building, boat oars and sweeps and numerous similar purposes, as it is light, tough and very elastic. For these reasons it is claimed that it should make a very satisfactory substitute for American ash, which is used almost universally for the purposes named, but which as is only too well known here, is rapidly becoming exhausted.

Mountain ash, as the name implies, is essentially a timber indigenous to mountain ranges, and grows in abundance in the higher levels of the southern tablelands, more particularly within the snow belt of the country of Selwyn (Tumut district), where one large forest reserve known as "Bago" exists, containing an area of upwards of 72,500 acres, densely covered with this valuable timber. This reserve is situated about thirty-five miles by road from Tumut, and will in the near future prove a source of great value to the state.

✤

Of the various chemical substances that have been used with a view of rendering wood fireproof a solution of silicate of soda has been proved to be the best. Wood painted properly with the solution has been found not even charred after long exposure to fierce flames.

✤

A man may aim at perfection in foremanship and never get there, but if he keeps it up he will get nearer to it than the man without high aims.

The Carpenter Trade

To the Editor: Indianapolis, Ind.

I wish to congratulate the AMERICAN CARPENTER AND BUILDER on the grand paper they are giving us and congratulate the carpenters of our land of being able to secure such a valuable help to us, which is not only valuable to us every thirty days, but every day of the year.

Some learned men come out in our daily press, very often with an argument that the day is at hand when the apprentice is having a hard time, and some go so far as to lead us to believe that it is almost impossible for him to learn the carpenter's trade. They claim that the carpenter himself is getting selfish and does not care to have any more learn his trade and that when they do try, the carpenter will take no interest in them, and all the interest that the contractor takes in them is to get all the work he possibly can and give them just as little for it as possible. While there is perhaps much truth in these claims, I wish to here just drop one word, and that is, that there never was a time in the history of the world when the apprentice boy could learn so much in so short a time as he can to-day, and that the world is full of kind carpenters, who are willing to do all they can to help along a deserving boy.

One great trouble with the boy of to-day is, that he is above too many kinds of work. He should remember all work is honorable and all kinds must be done by some one and he should be willing to do his share. The boy of to-day who does his share and does it as well as he knows how and observes all the little matters as they come along, and who does not get too impatient to take up the big and difficult matters, and who reads some of the many good works on the subject of carpentry, will soon be able not only to do the work as the architect has planned it, but he will soon be able to plan the work himself.

There is perhaps no trade or calling where a boy can start at the very bottom and work himself up to practically as high as a man can go as readily as in the carpenter trade, and what could be greater or more honorable than the planning of an ideal home?

What would the great financiers and business men of the world do if some one did not plan and build their business blocks and office buildings? I wish to say to the boy who has to shingle and do it day after day until he thinks he will never learn anything else: Do not get discouraged, but make as good a roof as you can, for it will get you into the habit of mastering the thing at hand thoroughly.

There are too many carpenters in this world to-day who just hammer away and who never read a publication, published especially for their interests, and it is not to be wondered at that they think it is a poor trade and get disgusted with it. But who is at fault? Is it the trade or the man? To the young man of to-day who chooses the carpenter trade and makes the very best he possibly can of it, and keeps his tools in good order and learns how to sharpen them, and studies his trade in general and especially his steel square, will never regret that he chose the noblest and best trade in the world for his life's work. I would do anything in the world to help the carpenters of our land, but know of nothing I could do which would do them more good than to get them all to read the AMERICAN CARPENTER AND BUILDER.

DWIGHT L. STODDARD.

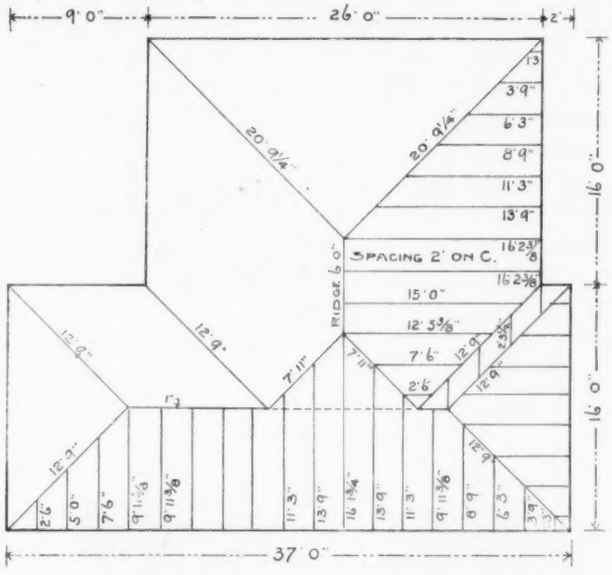
How to Frame a Roof

To the Editor: Point Eastern, Va.

I am sending you a plan of a two-story house. Will you give me in the October number of the A. C. & B. a plan of a hip roof for this building? The cornice will project 1 foot 6 inches from the plate. Give lengths of the hip, valley and common rafter.

J. E. CHRISTIAN.

Answer: As Mr. C. does not state the pitch desired we will assume it is a 9-inch rise to the foot. The accompanying plan gives the length of the various rafters, and, by referring back to Figs. 66 to 71 of our regular articles found in the June number of this magazine, will show how to place the steel square to obtain the cuts and bevels. Also see Fig. 77 for cutting the hips and valleys. Care should be taken to see that the dimensions of the building are correct and the angles perfectly square. The net lengths of the rafters are given so that it is not necessary to make deductions for the ridge piece. The measurement for the jacks is given for the long side.



A. W. WOODS.

Proper Moulding to Use

To the Editor: Brattleboro, Vt.

I would like to have your opinion as to what would be the proper kind of plate rail and picture moulding to use in a dining room finished in quartered oak, finished natural. There is a dark green paper two-thirds from base up, and a grape-

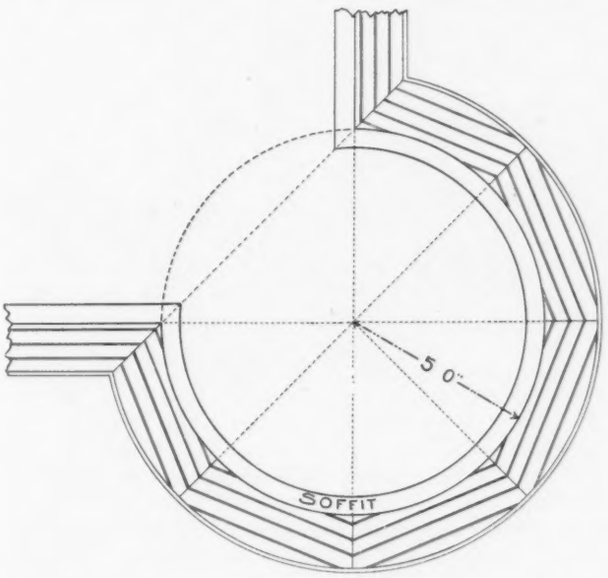
vine design from plate rail to ceiling. The painter suggests a white enamel plate rail and picture moulding, regardless of the woodwork. GEORGE CROLL.

Answer: While white enamel plate rails and picture mouldings are undoubtedly a good deal used, they are, as a rule, suitable with dark paper only, when all the woodwork of the room is finished in white. If the paper is light then the plate rail may be white entirely, irrespective of the woodwork. In the present case, I should suggest using either an oak picture rail, or else to paint it in flat color (thinned with turpentine only) to match the green of the lower wall, or some shade of green in the upper-third. Another treatment would be to use a flat black picture rail. The green, however, is most harmonious. EDWARD HURST BROWN.

How to Ceil a Circular Plancier

To the Editor: Scottvile, Ind.

I inclose sketch of porch that I intend running a plancier of 5/8 by 4-inch ceiling. I have a 3/4 circle on one corner



and want to carry the ceiling around the circle. Could I divide it into an octagon or would the pieces be too long?

A. L. PALMER.

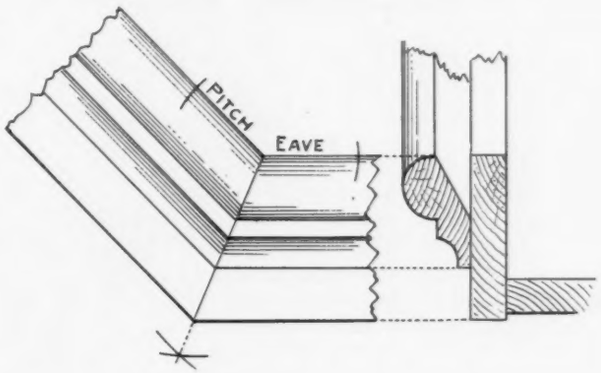
Answer: We herewith reproduce Mr. Palmer's sketch showing the 3/4 part of the circle divided up into octagonal parts, which is all right, but would look better if divided into twelve parts. This would show nine parts instead of six in the 3/4 circle. EDITOR.

Intersecting Gable with the Eave

To the Editor: St. James, La.

Please give a rule for cutting and adjusting rafters when gable and eave cornice intersect in order to have the facias come same width. B. P. TINEAND.

Answer: Frame the rafters and valley just the same as for an internal angle. In cases of this kind, the plancier



should be level with plumb facia. Then the miter would stand at the half way point between the pitch and the level line of the eave as shown in the illustration. The different pieces will number and be of the same width. EDITOR.

Constructing Cement Cistern

To the Editor: Stratton, Neb.

What is the necessary thickness of cement or concrete in a cistern which is placed in the solid clay soil and will withstand a pressure of 50 to 60 lbs. per square inch?

JUDSON POST.

Answer: Make walls of cistern 1 inch thick of one part Portland cement to two parts sand and three parts gravel, after which cover inside surface with wire netting (1½-inch mesh or smaller made of No. 16 wire), and cover same with ½ to 1 inch cement plaster made of one part Portland cement and three parts sand. Let harden for three weeks and then paint with a thin lead and oil paint, and after several days' drying the cistern, if not over forty pounds capacity, will hold an air pressure of sixty to seventy pounds per square inch. EDITOR.

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PRACTICAL TRADE APPLIANCES

Front Rank Steel Furnaces

Steel furnaces are not a passing fad. The fact that at the present time two-thirds of the furnaces used in the majority of large cities, where furnaces have been in use for the past fifty years, are steel, is a pretty safe indication of their efficiency. This condition has been a steady growth for the past few years.

The Front Rank Steel Furnace, manufactured by the Haynes-Langenberg Manufacturing Co. of St. Louis, has been on the market nearly twenty years, and at present is sold in every State in the Union where furnaces are used. This extensive growth of business is founded on merit and a further proof of merit is the number of imitations that are now made.

The Front Rank Furnace has large double or single doors, as desired, and is made in six sizes, for portable casing or brick setting, and is guaranteed to burn hard or soft coal, wood or coke. It can also be easily fitted with a gas ring where natural gas is in use. Any hot water combination can be used in the Front Rank.

This company has always done a large installing business locally, and have about ten thousand furnaces in use in St. Louis alone. This personal contact with the actual working condition has been of inestimable value in teaching them when changes were desirable, and from time to time they have made them, until they believe they have as nearly a perfect furnace as can be made.

To be an economical heater a furnace must have a large amount of radiating surface in comparison with the size of the fire pot and this surface must be arranged so that the air in passing upward must come in close touch with every part of it.

It will be observed that the Front Rank Furnace is built on straight vertical lines, thus causing the air in its ascent to come in direct contact with the entire surface. This principle is essential in a successful heater and is one of the strongest features in the construction of our furnace.

The front rank has no direct draft to warp out of place and let the heat escape straight up the chimney. In this furnace the products of combustion have to pass through the two radiators and the dust box before making their exit into the chimney.

The Front Rank drum or fire chamber is made of a solid sheet of heavy armor plate, with but a single seam, closely riveted like a boiler, and is absolutely gas tight. Heavy cast flanges are placed around the openings where the smoke passes from the drum into the radiators to protect the steel. The circular shape of the drums and radiators is an absolute safeguard against buckling.

The Haynes-Langenberg Mfg. Co., 2309 Lucas street, St. Louis, Mo., will be pleased to send our readers any information they desire.

A School of Practical Plumbing

It is absolutely necessary for the modern carpenter and builder, particularly in the smaller cities and towns, to be well posted in every detail that enters into the construction of a house, school house or other building. In order to become entire master of the trade of construction a modern carpenter must be able to not only lay out, frame and roof a house, but must also be able to equip it with sanitary appliances. Of course, this is not so necessary in the great cities, where the trade is subdivided into many divisions, but in the smaller places it is almost imperative.

For this reason the announcement of the St. Louis Trade School of Practical Plumbing on another page should meet with the response of all of our readers who have not as yet mastered the intricacies of the installation of modern sanitary plumbing. It is the purpose of this school to equip its students with such practical knowledge and skill that they may be able to enter upon the work of the plumber's trade immediately upon the completion of their courses in the school. It is a special aim and design of the faculty and managers to make the knowledge and training useful. Not only is the technical and manual training side emphasized, but likewise the business side. Suggestions covering the whole scope of the plumbers' interests and affairs are freely made by the instructors, who have had thorough experience in every branch of the plumbing trade and know where advice is needed. The student is given a practical knowledge of the principles that govern the planning and construction of plumbing.

The special advantages of the plumber's trade are numerous. In the first place, employment is always at hand and the supply of workmen is not equal to the demand. With the journeyman the tendency is for the number of hours required in a day to become shorter and the wages to increase. There is plenty of room and the competition is not strong. The master plumber's business is very profitable. Any ambitious person with good common sense can acquire the trade and become a skilled artisan.

A large number of our subscribers who have strong ambitions for their boys are unable to decide for their future. They hesitate to have them follow their own trade, partly on account of the accidents that occasionally happen to the builder and partly on account of the fact that there are many idle days when the wages stop on account of weather conditions. The plumbing trade is one that the weather does not influence, excepting that the worse the weather the better it is for the trade. It would be well for these hesitating fathers to write the St. Louis School of Practical Plumbing for one of their catalogues, covering their complete course of instruction.

When the young man learns a trade like this he has in his own hands the means of supporting himself and is not dependent upon good luck and friends. He has that which makes him a useful member of society and he has ability, with his skill and knowledge, to add to the wealth of the world. He always has a competency and may acquire independence.

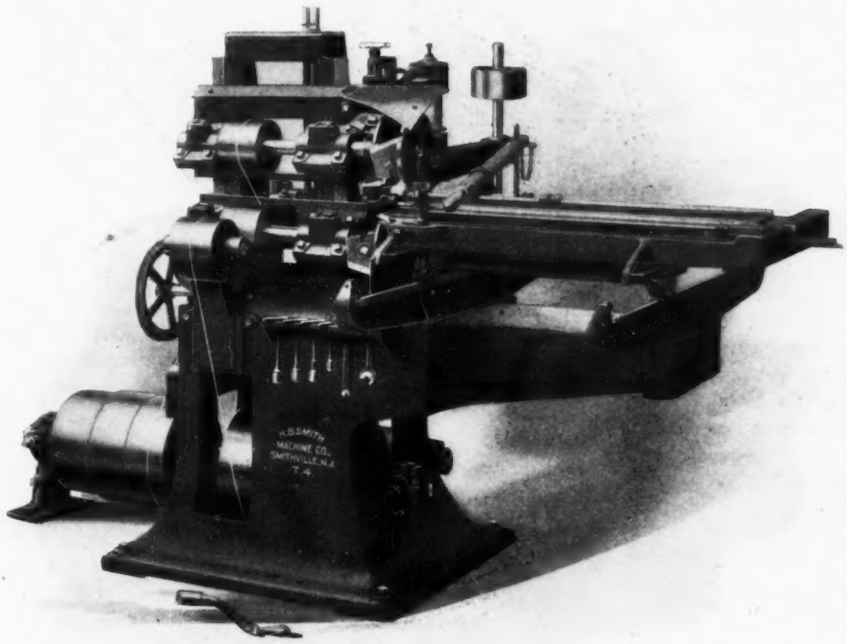
The Goshen Engine

The extraordinary demand for gasoline engines has prompted many new manufacturers to enter this field. In another column will be found the announcement of the Goshen Motor Works of Goshen, Ind. They have perfected an engine that is simple in construction, has few working

parts and produces the maximum of power. Their engine is guaranteed free from defects and breakage for one year. Its construction is simple, there being no valves, cams, gears or springs in its working parts. As the pistons pass up and down in the cylinder they open and close the ports of the engine, thus exhausting the burnt gases and admitting the new charge. All sets of rings in the Goshen engine are guaranteed by its manufacturers to run three to four years under hard service without leaking.

A New Tenoning Machine

The H. B. Smith Machine Co., Smithville, N. J., have placed on the market a new single-end tenoning machine,



No. 225 Ce—Single End Tenoner.

which fact should interest all of our readers who use woodworking machinery or handle its product. It is made in several modifications to meet the various requirements to which such machines are applied.

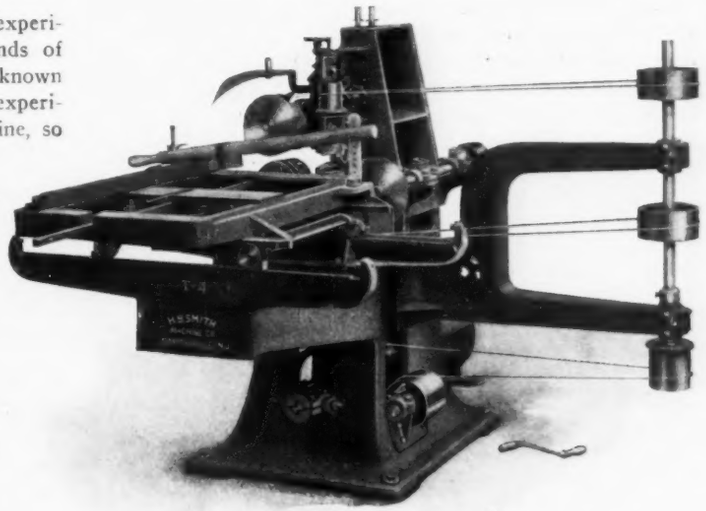
This Tenoner is the result of nearly sixty years' experience in the manufacture and construction of thousands of machines of its class, and is the culmination of all known valuable principles suggested by such an extended experience. The company's previous No. 2 Tenoning Machine, so well known to the trade, and which was complimented by being copied by so many manufacturers, has been displaced; but all of the valuable features of that machine have been retained and many improvements added. Like its predecessor, this improved machine is especially adapted for tenoning door, sash and blind work, for use in the cabinet department of car shops, and for all general cabinet and joinery framing.

The framing is of iron, massive and pedestal in form, cast whole and with base wide enough (30x34) to firmly support all projecting parts; the extension for supporting the table being curved from the operator so as to admit of following the work through the cutters. A chute is cast within the frame for directing the shavings to the outside.

The table is a radical improvement over any hitherto made, and in this lies the chief value of this machine as compared with others. The principal improvement is, of course, the roller bearing, which is constructed on principles thoroughly tested. The table must always move square across the ways, because the rollers are connected together and kept square or parallel by a guiding or riding frame. Therefore, if the rolls move at one end, they must also move at the other, and hence the whole carriage must move, no matter where you take hold of it or how much weight is upon it. For instance, a man can sit on the table and the operator could take hold of the outer end of the gaugebar, and with two fingers move the table in either direction, perfectly square the entire length of the ways. The rolls next to the cutter heads are grooved to prevent end motion, and all are protected perfectly from shavings, likewise provided with leather scrapers for removing any accumulating dust.

The headstocks are substantial and are adjustably gibbed to the upright framing. They are movable up and down by two screws, so arranged that they may be moved in either direction, both at one time, or separately, as desired, thus perfectly controlling the size and position of the tenon. The upper headstock, with its spindle, has a horizontal or longitudinal adjustment for regulating the position of the shoulders of the tenon.

The cutter spindles are all made of high carbon steel, turned and ground accurately to size and to perfect roundness. The driving shaft in the base which carries the tight, loose and driving pulleys is of 1½ inch special quality drawn steel. The bearings are all compensating and self lubricating, and lined with best Babbitt Metal. The belt compensating tightener of the spindles is also self adjusting to all positions of the belt. The copes are attached to the main headstocks, and of course adjust with them, but have both vertical and lateral adjustments independent of the headstock movements, these independent adjustments being controlled by suitable screws with hand wheels, and the spindles are driven by a vertical countershaft with longer belts than usual on such machines.



Rear End View Showing Carriage, Copes, Cope Countershaft and Application of Cut-off-Saw.

The tenon heads may be used double or single and have 7½ inch cutting circle. When machine is fitted with double heads it will cut tenons as long as 6 inches; when fitted

with single heads it will cut tenons only 3½ inches long. The upper and lower heads expand or separate to take in stock as thick as 5 inches, and the table movement will admit to cut tenons on stock as wide as 20 inches by 1 inch thick. By passing material through twice tenons may be cut as long as 8 inches. The knives are placed on the heads so as to make a smooth drawing cut, and are readily ground to the required shape. Improved spurs are used to cut the shoulders square and rarely require attention.

For further information subscribers should address the H. B. Smith Machine Co., Smithville, N. J., stating they are readers of the AMERICAN CARPENTER AND BUILDER.

Sheet Metal in Building Construction

Sheet metal has gained a prominence in building construction and house equipment that is perhaps hardly realized. With the increasing cost of materials formerly employed, with the more rigorous exactions of the insurance authorities and with the general willingness to adopt the promising improvements of these fast moving times, sheet metal has come to be largely used for outside protection, for interior embellishment, for sanitary wall coverings, etc.

It was our pleasure to recently visit the new and extensive plant of The Edwards Manufacturing Co., "The Sheet Metal Folks," Eggleston Ave., 4th to 5th Sts., Cincinnati, O., manufacturers of the most extensive line of sheet metal building material in the world. They are building a new addition of 137 by 200 feet which will make their new plant 287 by 200 feet. Having a practical experience covering a period of over twenty years, a modernly equipped factory, with every known device for turning out perfect work, and using none but the best grade of steel with first-class mechanics for working same, the company and their product have a reputation that is world wide. They manufacture the Edwards Metal Ceilings and Side Walls, which are made of standard gauge soft steel sheets, shipping weight about 70 pounds per 100 square feet.

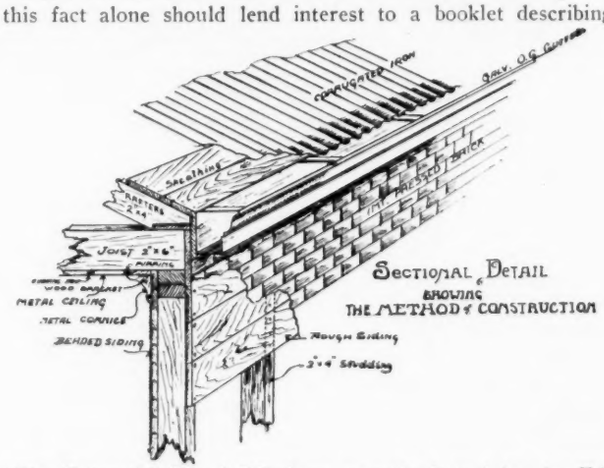
Their durability has never been questioned, and as to ordinary wear and tear will last a lifetime. They are particularly adapted for use in public buildings, churches, schools, stores, halls, theaters, hospitals and are being installed in private dwellings owing to their cleanliness and adaptability of ornamentation.

Being incombustible and almost air tight, they protect floors and woodwork in case of fire and have prevented the spread of flames and saved buildings from total destruction. Being waterproof, a valuable feature in favor of steel ceilings, they cannot be injured by water in case of fire or by leaks of roofs or pipe. They are light in weight, thus reducing the strain on trusses or joists to a minimum. They do not crack or fall like plaster or dry out and shrink like wood. They do not hold disease germs or vermin and can be easily cleaned with a sponge and water.

The Edwards Metal Shingles are made in three sizes, 7 by 10, 10 by 14, 14 by 20 inches, of pure sheet copper and the best grade Worcester terne tin, painted or galvanized (galvanized after being formed). The shingle is stamped and then galvanized, each and every one separately, by hand, consequently there are no raw edges, cracks or abrasions of the zinc coating. They can be applied to a roof of any type and are guaranteed to be an absolute protection against fire and the elements, taking a very low rate of insurance.

The Edwards "Perfect" hip shingles are an example of the latest and best in the roofing art. They not only protect the roof, but give it a finish and ornamentation which cannot otherwise be secured, except by the use of expensive tiling. They are absolutely impervious to rain or snow and when used in connection with the Edwards Metal Shingles produce a roof covering that will last a lifetime, and having no soldered joints, can be readily taken off of one building and placed on another without injury if desired. They are far superior to the ordinary wood or metal rolls and the work of laying them is considerably less. No trouble to lay them even and straight owing to the offset or shoulder fitting snugly against the butts of the shingles forming a gauge and a protection against driving showers of rain and drifting snow. The Hip Shingles are put on after the roof is laid, starting at the bottom.

It is only necessary to point out that statistics show that one-third of the fire losses is chargeable to what is known as the exposure hazard; that is, fire communicated from one building into another through windows or roofs, to indicate the importance of fire resisting construction in the exterior of buildings. Experts know that wire glazed hollow metal window frames afford an effective and reliable fire stop and this fact alone should lend interest to a booklet describing



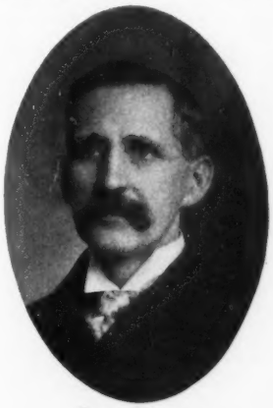
"The Edwards" Metal Windows recently issued by the Edwards Manufacturing Co., "The Sheet Metal Folks," recently installed in their new and commodious office and factory building, No. 401 to No. 417 Eggleston avenue, Cincinnati, O., devoted entirely to the production of everything in sheet metal building material, including "The Edwards" Metal Ceilings, metal shingles, metal fireproof windows, cornice, skylights, corrugated iron or steel roofing, steel imitation brick and stone siding, galvanized roof crestings, finials, etc. The company have just issued a new catalogue of metal ceiling and side wall designs of the different periods, which they will be pleased to forward to parties interested in interior sheet metal decoration. They have also in preparation their large general catalogue, comprising 160 pages, showing complete line, which will be ready for distribution about October 15th.

Ideal Concrete Machinery Co.

"The conception of a thing in the most perfect state." This, we are told by the dictionary, is the correct definition of the word ideal. Certain it is that a more appropriate name could not have been hit upon in searching for a trade title

for the time-tried and well-known concrete block machine patented, manufactured and sold by the Ideal Concrete Machinery Co., of South Bend, Ind.

From its inception this company has been in the front rank of those manufacturers whose first aim and object was to place the concrete machinery business on a clean-cut, legitimate basis. To that end they have spent thousands

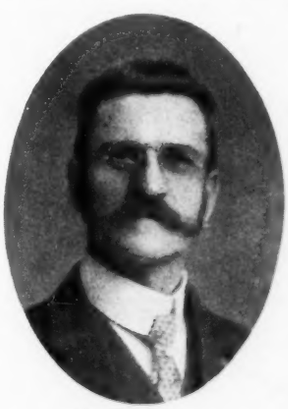


F. A. Borst

G. B. Pulfer

of dollars, not only for machinery necessary to produce the best product possible, but also in the various channels which conditions and circumstances created that required vast expenditures for educational purposes, that the real merits of the great concrete block industry might be properly understood, its value fully recognized and reputation established. How well they have succeeded may be judged from the fact that theirs is the largest exclusive cement block machinery plant in the United States, and they have recently found it necessary to build a plant at London, Canada, which is now in full operation. At a recent visit to the plant of this company, evidence of growth and activity were found on every hand, both in the factory and executive departments.

The plant is of very solid construction, and embraces 16,000 square feet of floor space. The basement is given over to storage purposes, where were observed great piles of "pallets," or "off-bearing plates." Here, too, are demonstrated examples of the various shapes and sizes of block made by the Ideal



M. Wetzstein

J. A. Smith

machine. The machine shop is very interesting from the fact that it contains some ten special machines of complicated character which were designed and built by the company for the special purpose of finishing the various parts of the Ideal machine with such acute exactness that each finished machine is as perfect in action as in the model from which the patterns were made. In this department are several devices for testing castings, in order that no defective piece enters any machine. The assembling room and shipping departments are of great interest because of the various systems in vogue that prevent errors in the filling of orders.

The officers of the Ideal Concrete Machinery Company are: F. A. Borst, president; G. B. Pulfer, vice-president and general manager; M. Wetzstein, secretary and treasurer, and J. Augustine Smith, general sales manager. The executive department embraces one large general office and a suite of two private offices. The offices are equipped with the latest filing system and handsome furniture. One feature is an unique system of state map records showing at a glance every town where Ideal machines have been sold. The office force consists of seven stenographers, accountants, and mails clerks, shipping clerks and office manager.

The growth of the business made it necessary for the company to secure the services of an expert sales manager to take charge of the selling and of the business, and they were fortunate in securing the services of Mr. J. Augustine Smith of Detroit, Mich., in this capacity. Mr. Smith is also financially interested in the company.

Four Practical Trade Books

The latest addition to the list of books devoted to the building trades are the four books published by the Coyne Trade School of St. Louis, Mo. They are no doubt the most up-to-date, complete and practical books on the plumbing and gas fitting trades ever written. The following is the list of the four volumes:

"Practical Plumbing by Questions and Answers."
"Practical Leadworker and Jointwiper."
"Modern Gasfitting Plans and Rules."
"Modern Plumbing Plans."

The books are of convenient size and fully illustrated with plans, elevations, details and half-tones. A detailed description of them will be found on another page.

Anniversary of a Unique Institution

Students of the International Correspondence Schools are much interested in the celebration of the fifteenth anniversary of the schools, which is to be held in Scranton on Oct. 16.

It has been nearly fifteen years since Thomas J. Foster, then editor of a newspaper in Shenandoah, Pa., introduced a method of teaching through the mails by means of special home-study textbooks and a system of direction and correction of students' work, the object of which was to enable the coal miners of Pennsylvania to pass the required examination for mine foreman. Although the enterprise was of great interest in the mining communities, not even the founder then dreamed that his plan was the creation of a new educational system that was to turn the world into a vast class room and afford the means by which practical, money-earning knowledge in almost every line could be carried to the thousands that could not give up work or leave home to secure education.

The International Correspondence Schools now have more than two hundred courses of instruction, covering almost every branch of nearly all of the well-known trades and professions. Up to the present time, 85,000 students have either completed the courses for which they enrolled or substantial portions thereof; 225,000 other students have completed the study of mathematical, physical, and drawing subjects. One hundred and fifty-three railroads, including some of the largest systems in the world, have made contracts with the schools for the instruction of their engineers, firemen, machinists, inspectors and other employes.

The wide-spread practical results of the work of this great "home-study" university is demonstrated by the fact that during the last 12 months upwards of 4,000 reports of increased salary or advancement in position have been received from students.

The foregoing figures are all the more wonderful when it is remembered that the largest number of students graduated by any one American resident school is 28,000, and this is the record of Harvard University, an institution more than

200 years old. The International Correspondence Schools are filling a great need that before was not met by any educational system.

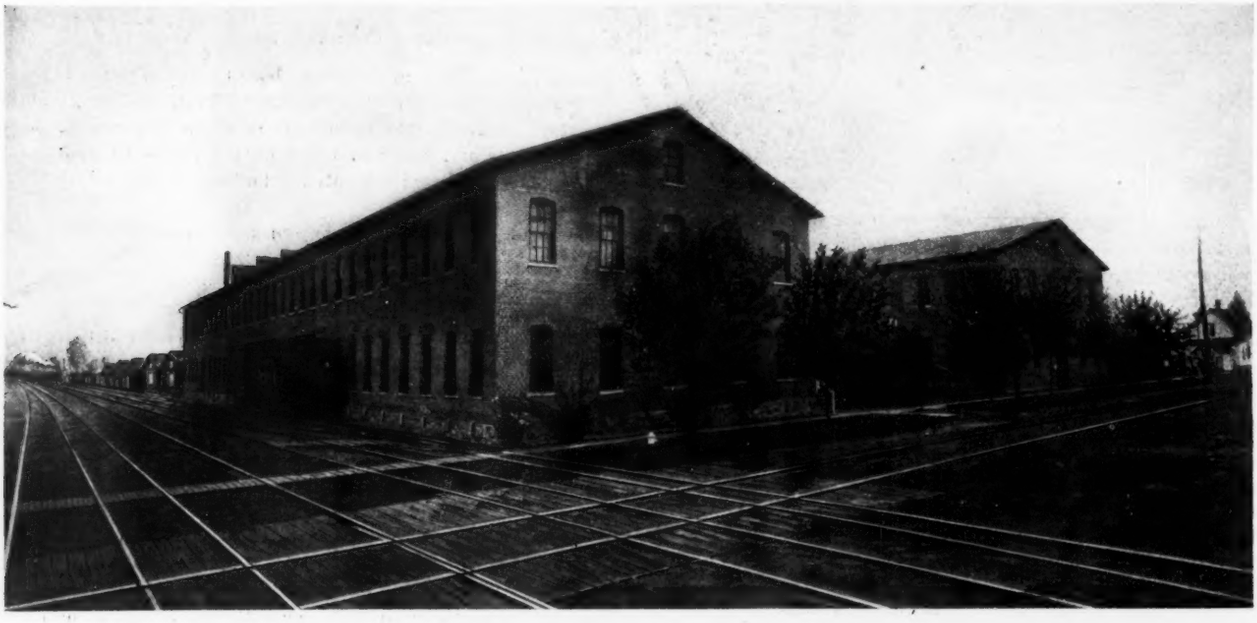
The day will be taken up with appropriate exercises and an interesting exhibit of the schools at work preparing and printing home-study textbooks and correcting the recitations of students sent in from every part of the civilized world. A banquet to the guests will be given by the schools in the evening.

Goshen Sash and Door Co.

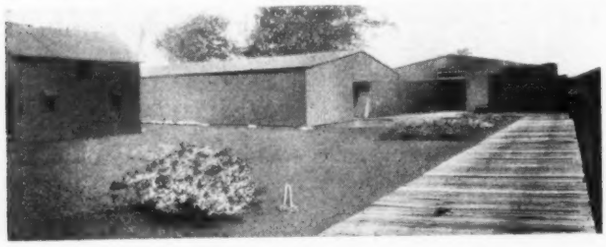
One of the pioneer manufacturers of sash, doors and interior finish in the north central states is located at Goshen, Ind. The founder of the Goshen Sash and Door Co. was R. W. Whitmer, who established a small carpenter shop and planing mill at Goshen in 1869, at which time northern Indiana was nearly a wilderness. From the first the Whitmer motto has been: "Not how cheap, but how good." In the production of all work this has been the foundation rock upon which the business has been built. Another principle leading to success was the bending of every energy to make prompt shipments of all orders whether for stock or special work. The success of the company in this direction has gained for them the reputation of being "America's Quickest Shipping House" and forms an important factor in their advertising.

Upon the death of the elder Whitmer in 1883, the responsibilty of the management fell to his sons, S. H. and T. E. Whitmer, both of whom were early given an education in the business by working first as apprentices and then as journeymen in every department of the plant. This practical education enabled them to follow their father's success and they have ever maintained the standard established. It has been under their successful management that the plant and business have experienced such remarkable growth. From time to time the plant and equipment have been added to until it now occupies about four acres. The main plant is a brick and stone structure 56x160 feet, two stories, while the warehouse is 50x210 feet, has three floors and every convenience for storing and handling. In connection is a very extensive series of sheds 40x110 feet. The entire plant is equipped with all modern labor saving machinery known to the trade and every effort made to keep the business not only up to but a little ahead of the times.

The advertising and literature sent out by the company contains very positive statements of three facts which they have firmly established in the minds of the trade, to wit: "We positively ship all odd work in four to seven days," "America's only quick shipping house" and "Goods of highest grade." These announcements are as persistently lived up to as they are made and both new and old customers can rely on them being fulfilled. The location of Goshen is such that trunk line connections are afforded both north, east, south and west, hence no delays occur in transportation.



Plant of the Goshen Sash & Door Co.



Corner of Storage Yard

Burrell Guaranteed Block Machine

The giant strides made and to be made in cement construction from building blocks offer rare opportunities for profit. The south and southwest the coming winter and spring will see this industry firmly established. Those who "take time by the forelock" and place their orders for block machines now will be sure to receive them, whereas delay will probably see many manufacturers obliged to reject late orders. The Burrell Guaranteed Block Machine manufactured by the Burrell Mfg. Co., Bradley, Ill., is sold under conditions that show the manufacturers ready to stand behind it. It has no complicated parts and has proven satisfactory to all who have purchased it.

Melon Thoughts—By a Furnace Man

MR. CARPENTER AND BUILDER:

Dear Sir—We had a Georgia watermelon for dinner the other night. A little flat and stale, perhaps, for it came a long way: and the corner fruit store man charged us sixty cents for it. He bought it from a Chicago distributor, who

bought it from a South Water street dealer, who bought it from a shippers' association. The shippers' association probably paid the grower ten cents for it. The difference is represented by the freight and the profits of three or four middlemen. Had I been in touch with the grower he would gladly have sold me the melon for fifteen cents. I would have been forty-five cents ahead and the grower would be richer by the 50 per cent greater price.

The transaction impressed me as a shining example of the positive advantages of direct dealing, between producer and consumer.

I am selling Hess Furnaces direct from shop to user, at factory prices, and the question is many times put to me, "How can you afford to sell your product at a price so low? Where do you 'skimp,' in order to make a profit?"

I don't have to "skimp." I am in the position of the melon grower. If the consumer comes to me I can give him a much better price than he can obtain otherwise, and still treat myself a little better than the jobber would treat me, if I depended on jobbers for business. And I can do still better for both of us, in this: that I know my goods better than any jobber or dealer can know them, and with such knowledge I can plan and advise as to their use better than anyone else, and this means more satisfaction for the purchaser.

And again, I want to keep on making and selling Hess Furnaces. It's my living, and I would naturally take more pains to please my patrons, than any middleman, to whom Hess Furnaces are merely an incident and not "the whole thing."

I got this idea five or six years ago and started such selling in a small way. It grew and grew. Now it's the biggest part of our furnace business and growing faster than ever. Recent orders have been received from New York, Boston, Vermont and other far east points where you would hardly look for buyers of Chicago-made goods. From all other sections North, South and West, and even from Japan, orders are coming a-plenty, and the many letters of approval from pleased customers add not a little to the satisfaction of successfully carrying out a plan, which, at first, seemed almost impracticable. Yours very truly,

GEO. H. HESS, JR.,

Secy. Hess Warming & Ventilating Co., Chicago.

All Steel Corner Posts

Our readers, no doubt, are deeply interested in the erection of modern plate glass store fronts and show windows, and their attention is called to the advertisement of C. H. Shultz of "All Steel" Cork-Bedded Corner Posts, Mullions and Transom Bars. The posts and bars are made from ⅜x2-inch steel bars and ¼x¾ steel angle bars; are adjustable to any thickness of glass, insuring the most substantial and handsome bar made. No putty or rubber used. The bearing of the glass is all on Spanish cork, the best known backing for plate glass. It provides for expansion and contraction of the glass and for the shrinkage and settling of the building; is absolutely water, wind, dust and snow proof. The glass is put in from the outside; the bars are neatly finished on inside, and takes up but two inches of space. The outside finish is polished brass, making a very handsome appearance. The bars are all accurately fitted before shipment, and ready to erect.

The bars are put up when desired, and the manufacturers would be pleased to mail you samples of bars and quote prices on application. Address C. H. Shultz, St. Joseph, Mo.

Automatic Sash Holder

The Automatic Sash Holder Company, 277 Broadway, New York, has just placed on the market the automatic sash holder here shown. It is designed to automatically hold in any position required both upper and lower window sash, without using sash cord, weights or pulleys. The idea grew out of the necessities of portable house construction, where large window frames with weight pockets were impossible and superfluous material was discarded, the above company being practically identical with the Ducker Company, at same address, which manufactures portable houses of all kinds. The principle of this holder has been thoroughly tried out for several years in portable house construction, and now, greatly improved in every detail to satisfy more exacting conditions, is offered for permanent structures. The body of the holder requires only an easily made mortise in the stile of sash, about 3¼x⅞x1 5/16 inches, all of which

WHEN we make the statement that a great majority of all the important buildings and manufacturing plants of the country are roofed with Coal Tar. Pitch and Felt along the lines advocated in the Barrett Specication, it would seem as if no higher commendation could be secured.

Yet added evidence of its value is the fact that the foundation walls and cellars in most of these structures are also waterproofed with the same materials. The famous Trinity Building, New York, illustrated herewith, is an example of this.

THE BARRETT SPECIFICATION ROOF is the most suitable, satisfactory and economical known. The practical application of this fact is daily demonstrated by every reputable roofing contractor in that he will guarantee such a roof *absolutely* for at least ten years, as against the *qualified and provisional guarantee* given with other roofings.

Metal, and most "ready roofings" require coating or painting every two or three years. Failure to do this, either through oversight or false economy, causes such roofs to quickly rust or rot out, and leak. Thousands of dollars worth of merchandise are destroyed annually through leaky roofs.

The Barrett Hand Book, covering the subjects of roofing and waterproofing, will be mailed free on application.

Barrett Manufacturing Company

New York Philadelphia New Orleans Allegheny
Cleveland Chicago St. Louis Cincinnati
Kansas City Minneapolis Boston

can be done with a 7/8-inch auger bit and chisel, mortises for new work being machine mortised at the mill. When in position the wheel runs up and down on the jamb of window frame and the holder is absolutely out of sight. The two portions of the frame are formed by special machinery from

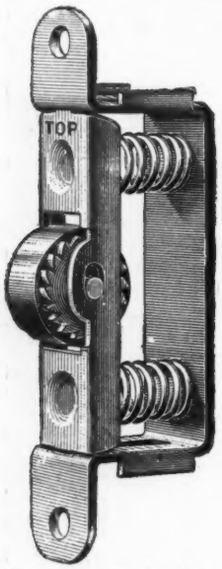


Fig. 1—Automatic Sash Holder, Nearly Two-Thirds Size.

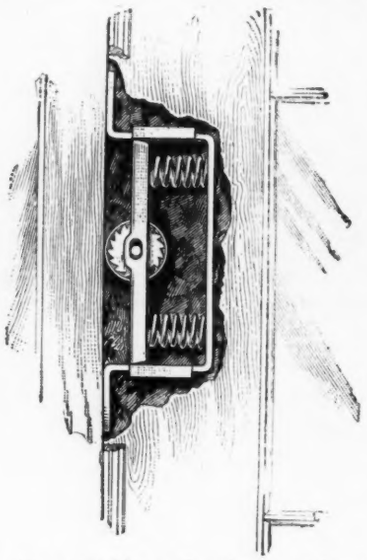


Fig. 2—Holder in Position, with Part of Stile Cut Away.

5/64 inch sheet steel. A binding or holding friction pressure is obtained by means of two electro galvanized piano wire steel springs, which are 9/16 inches in diameter and held securely in place by large bosses stamped top and bottom in both plates. The wheel pinions, it will be seen, revolve in two elongated or oval holes, with a play of about 3/32 inch, so that as the sash is raised the wheel revolves, but when lifting ceases the wheel axles move upward in the slot, and the ratchets engage with each side of the upper plate sufficiently to hold the sash at any desired point. The company emphasizes some of the following advantages, viz.: that hardware men and others can buy them in sets of four, so as to retail profitably for less than the cost of weights, cords and pulleys; that while equally suitable for old or new construction, in the latter case there can be a great saving both in material and freight, as well as bulk, by having window frames made without weight pockets; that owing to constant side pressure, windows, regardless of swellings or shrinkings, will always fit snugly and thus not rattle. For the average window a holder on each side of each sash up to twenty pounds will answer every purpose, they being especially suitable for residences in town or country, apartment houses, factories, cottages or any of the innumerable structures requiring windows. The holders, it may be said, have been successfully used on sash as heavy as thirty-five pounds each, the only objection to using them on very heavy sash being the greater strength needed to raise and lower the sash. For sash weighing eight pounds each or less one holder on a sash is sufficient, thereby reducing the cost one-half, and for sash heavier than the average four holders could be used on each sash instead of two, if necessary.

White Cement Stone

White stone made under the "Berlin System" is a revolution in stone making; it is artificial only in the sense that machine-made ice is artificial. It is an improvement on natural stone not only in appearance (does not become streaked with age) but in strength and uniform texture, and it makes a dry wall. Rain and cold days can be turned into profit; stone can be made under cover, and no skilled labor is required.

The Abel machine is easy to operate and puts the cheap-

ness of producing cement stone beyond competition and the stone is adapted to use in the highest class of buildings. This machine is made for the use of the laboring man with no knowledge of machinery. It does not require the services of a machinist to operate, keep clean, or overlook its working parts, and requires no pallets.

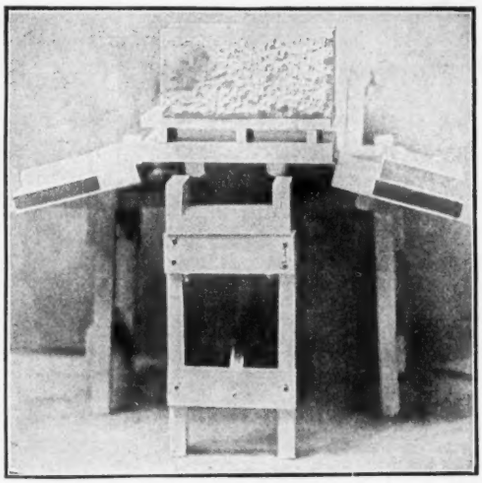
It is a machine that will turn out more blocks, handsomer, and stronger, blocks that are absolutely damp-proof. A machine too simple to get out of order, too strong to break, no hinges, wheels, levers, cogs, gears, thumb-screws or latches; in fact, nothing to be tamped out of place. One block is turned out just like the other, and always with true, sharp corners and perfectly square blocks all day long.

Ignorance of many men in the correct working properties of Portland cement is responsible for failures in making cement blocks. Perfect crystallization is necessary to the proper formation of stone. The Francis Machinery Co., 806 Chestnut Street, St. Louis, who manufacture the Abel machine, will be pleased to send any information desired to our readers.

The Nurock Cement Stone Machine

The accompanying illustration is an inside view of the Nurock Cement Block Machine which is being manufactured at Delevan, New York. This new cement block machine is certainly a wonder in its line, as the machine will make anything in the stone line required in the way of a hollow block. It will make plain face, rock face and corner blocks and is easily operated and not complicated. This machine has been examined by a representative of this publication and found to be all that the manufacturers represent it.

As shown in the illustration it is capable of many changes in making various styles and sizes and giving the largest variety of block products for the least outlay of capital. It can be operated by one or two men, and will turn out easily thirty blocks or over per hour. The machine complete with all necessities for making blocks as above stated is being sold at an extremely low price. The concern manufacturing this block has a nicely illustrated



catalogue with full information, which will be furnished for the asking if, when writing, the AMERICAN CARPENTER AND BUILDER is mentioned. The manufacturers are the Nurock Cement Machine Company, Delevan, N. Y.

Now Have Their Own Plant

We are greatly pleased to note and comment upon the rapid growth of The Duby and Shinn Manufacturing Co., Inc., of New York. This company is now branching out as manufacturers of a general line of mechanic's fine tools, with "The New Universal Square" as its leader.

This tool comprises the try square, bevel square, pitch-cut square, hip and valley square. It is also a correct rule,

LORENZEN MANTELS

A Mantel in the home is useful as well as artistic and decorative. It saves you furnace heat on chill spring and autumn days, and diffuses cheer and comfort like no other piece of furniture in the house.

Lorenzen Mantels

$10 to $250

In Colonial, Craftsman, Modern Mission and numerous other styles, and all woods and finishes. Our modern factory, large stock of air-seasoned lumber and expert, skilled workmen all mean beautiful mantels, far above the ordinary. We are at all times prepared to furnish designs of Mantels and Fireplaces in the historic periods of architecture, such as Louis XIV, Louis XV, Louis XVI, Renaissance, Gothic, Rococo, Empire, Early English, Colonial, Chippendale, Sheraton, Adam, etc.

No. 468.—Modern Mission Style, 5 feet 11 inches high and 5 feet wide; heavy plan, shelves, recessed leather panels; the brackets supporting main shelf are carved with Spanish Insignia. Forian-Vitrea tile hearth and facing. Hand-wrought Andirons of Romanesque design.

CATALOGUE FREE—Our new Book of Mantels, full of fascinating designs, reproduced from photographs, is now ready. It contains also illustrations in color, suggesting harmonious interior arrangements and decorations. Write for it today.

LORENZEN PAYS THE FREIGHT

CHAS. F. LORENZEN & CO., Inc., 275 N. Ashland Avenue, Chicago

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BRICK FIRE-PLACE MANTELS

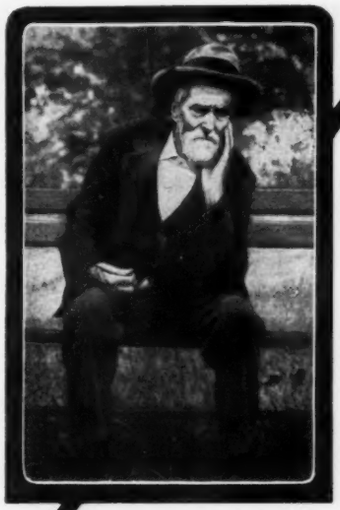
Beautiful Colors
Rich Carvings
Fine Designs

Only a sample of our Brick Fireplaces need be seen for anyone to appreciate the above facts. Can be built from our plans by any good mason. Send for our illustrated Catalogue containing 67 half-tones with prices.

PHILADELPHIA & BOSTON FACE BRICK CO.

DEPARTMENT 42

Office and Showroom, 165 Milk St. **BOSTON, MASS.**



He Never Had YOUR Chance

In this man's day there was little chance for the chap who started out in life as a workman with no special education. He was foredoomed to work for small wages until finally disqualified by old age. With **YOU** it is different. If you are not getting ahead as fast as you should in your chosen occupation, the **International Correspondence Schools** will help you either to gain advancement, or to change to an occupation where there is advancement.

Hundreds of building tradesmen have taken advantage of this opportunity to become foremen, superintendents, contractors and builders, or architects, and to double, triple, and quadruple their earnings. We can help **YOU** to do the same in your spare time, at your own home, and on terms to suit your present income no matter how small it may be.

Do you want to secure a better position? Are you willing to investigate the surest and quickest way on earth to secure one? Then send us a postal card today asking how we can help you and stating the occupation you wish to rise in.

INTERNATIONAL CORRESPONDENCE SCHOOLS

Box 910, SCRANTON, PA.

lumber gauge, straight edge, plumb and level, depth gauge; and draws circles, lays out mortise and tenons, octagonal cuts, etc., etc. It requires no adjustment for all these uses, and is guaranteed in every particular, consequently the mechanics are ready customers, and the leading jobbers of hardware and tools are enabled to make large sales of the article.

This company has purchased a large parcel of land with a two-story building at Branchport station, Long Branch, N. J., and have been for eight weeks getting under operations in their country quarters. The President announces the completion of preparations, and that the plant is now running with a full force, and hopes that the trade will not feel put out with them for their recent delay in making shipments.

This company also announces that they would like to have submitted to them any small mechanical tool that is not on the market, or an improvement on present tools, and they will consider the manufacture of the same, after due examination by their tool experts.

Dry Walls Without Cost

This is practically what is offered by the Walton Stone Machine Co. of Kansas City, whose advertisement will be found in another column. The peculiar features of this machine merit close and careful consideration, because if claims made by them are sustained by investigation, this machine marks another long step in the advance of the cement stone industry. Theirs is a two-piece machine, which permits the separation of the inside from the outside wall, leaving no point of contact between the two, and by taking advantage of this separation they are enabled to make a wall so certainly and safely dry that they do not plaster their walls—instead they finish with simply a white coat on the stone itself. This saves cost of all furring, lathing and brown coat of mortar, and for this reason they claim justification in saying that dry walls cost nothing—that is, nothing in addition to what wet walls cost. Their catalogue gives all particulars of construction and the principles involved, and is a very neat and instructive book which should be in the hands of all persons contemplating building with cement stone. It is free, and they invite correspondence on any and all topics of interest to the cement user. It should also be borne in mind that the Walton people are not merely building a machine to sell—they build especially to use—as they are practical builders of wide general experience, and especially in cement work.

Latest Type of Block Machine

We have, by invention, found innumerable uses through which cement can be applied. It is now molded into shapes not thought of years ago. The wonderful plastic nature of cement makes it possible to mold many different designs, which can be produced very cheaply.

One of the most important uses to which cement has been adapted, is the making of hollow building blocks. The use of these blocks has become general. Buildings erected by them do not require continual painting and repairing, as do those built of brick or wood.

To fully realize the advantages of cement, it has become necessary to mold it in the most convenient forms for practical and economical use; thus, it depends upon the invention or machine that is the most practical and adjustable to the largest range, to cheaply produce this work. We realize that there are many extravagant claims made for machines of this class. To investigate these claims would reveal the fact that they are not the ones desired for the manufacturing of this class of material. We desire to say a few words in regard to the Hoosier C Machine, which is manufactured at Auburn, Ind., by the Hoosier Manufacturing Co. It is of the face down type, forming the face of the block in the bottom of the mold. It is adjustable to make blocks of

different widths and lengths, using the same face plates and iron pallets for either size of blocks. The adjustments are positive and require no measurement in changing from one size to another. The simplicity and ease of operation, together with the automatic delivery of the block and the cores being operated by lever, make it one of the most rapid machines in use. The Hoosier, having no intricate mechanism, enables the operator to produce blocks with great rapidity. Any man with ordinary ability, with a little practice, will be enabled to produce the highest grade of blocks on this machine.

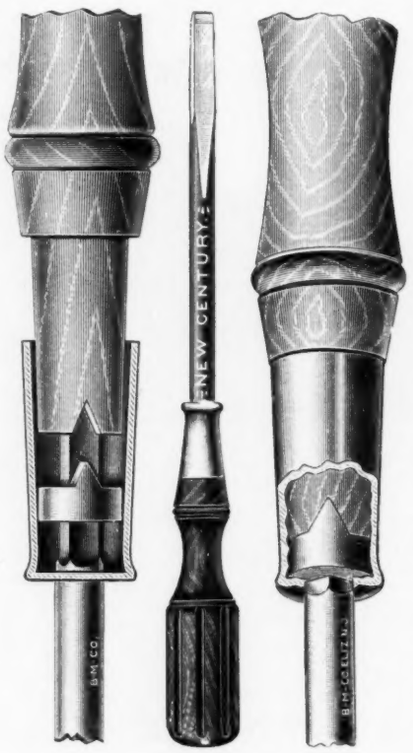
It is the most complete block machine in use. The outfit is priced complete, including iron pallets that enable the operator to make blocks geometrically true. We would advise prospective buyers to address the manufacturers for catalogue and price.

Gentzen Art Glass Co.

Art glass is becoming more of a factor in building construction each year. Where its use was formerly confined to larger public buildings such as churches and schools it has gained a firm place in adding to the decorative and ornamental possibilities of modern home construction. The Gentzen Art Glass Co. of Anderson, Ind., make a specialty of special designs in art glass for windows, doors, etc. They also do mirror and furniture work for the trade and sell glass of all descriptions. Simpson W. Day is secretary and treasurer of the company and Wm. O. Mathews is manager. Both have had years of experience in the line and thoroughly understand the business. In the company's ad on another page will be found a handsome window design, which they are offering at $1.50 per square foot.

The "New Century" Screw Driver

The Braunsdorf-Mueller Company, Elizabeth, N. J., makers of the highest grade of mechanic's tools, have just placed on the market an important addition to their line. The "New Century" screw driver, as illustrated herewith, is designed to give the carpenter a tool that he can absolutely depend upon. By means of the sliding toothed bolster two things are accomplished most effectively. First: the joining and locking of the blade to the handle so no amount of abuse will make them let go; second, the transmission of a hammer blow to the blade from the bottom of the handle, same as, for instance, a tanged carpenter's chisel, thus preventing the handle from splitting. In manufacturing these screw drivers it takes heavy blows to join them, but when they are "put" they everlastingly stay so. There are three



styles of these screw drivers. No. 100 is for general use and consists of highly finished hardwood handles, red-fibre finish, polished tool-steel blades tested and warranted perfect, with finished points ready for use. No. 115 is the same as No. 100, but the tangs go clear through handles to the extreme ends of which steel caps are riveted to take hammer blows without injury to the handles. No. 120 is also the same as No. 100, but has slim blades for cabinet makers, piano makers, etc. The manufacturers advise carpenters to apply to the dealers for the "New Century" screw drivers, but say if the dealers cannot supply them to write direct to the makers.

The Best is the Cheapest

A machine should increase and regulate force and motion to that extent that its product will be made better, or the cost lessened, or both, as compared with hand work. If not, is it a machine? A machine should be adjustable to make all shapes, widths and lengths. If not, it is not practical. A machine should work automatically; if not it lacks economy. The greatest speed and therefore economy has been reached in the Walton Machine because of the automatic opening and closing of the mould box with one movement, delivering the block in the shortest possible time.

The Walton Stone Machine is the most practical and economical, as one man can operate it and make from 100 to 150 blocks per day; one man can lay the blocks. It needs but one day's run of off-bearing pallets, as all sizes, shapes, lengths and widths of walls are made on the same pallets. It does away with wood pallets. Iron will not warp or swell while damp and thereby cause imperfect blocks. The L block fits to all sized walls, corners and openings and but the one shaped block need be carried in stock. It makes a saving of 8c per cubic foot in material over hollow blocks. Above all, it makes a water-proof wall. The time required for laying the Walton block is about one-third of that of laying brick, and but one-fifth of the mortar is needed—hence economy in both material and labor.

Concrete has become one of the most important building materials used in modern construction, and its use insures an absolute hardness and strength that will not deteriorate, provided the necessary care is taken in its manufacture. Read the advertisement of the Walton Stone Machine Co., Kansas City, Mo., and write them if you desire further information.

The Snell Mixer

The Snell Mixer, No. 1, is very simple, durable, easy to keep clean, and at a very reasonable price. It is just the mixer for a small block or brick plant. It will mix the finest of sand and cement together, any moisture desired, from a mealy dry to a sloppy wet, without balling.

The mechanism is simple, the mixer throughout is strong and solidly built, there being no parts to get out of gear, and no skilled engineer required to operate. All machines are equipped with either steam or gasoline engine, to suit purchaser, or if desired, will furnish mixers fitted with pulley for electric power.

The mixing drum revolves on ball bearings, making it light running, and requiring less horse power to the yard of concrete than any other mixer on the market. The entire drum is open to view, and is quickly and easily cleaned, there being no blades or deflectors to gather the concrete. The mixing drum makes from twenty-five to thirty revolutions every minute, turning the mass of concrete two and one-half times each and every revolution. Each grain of sand and gravel is thoroughly coated, thereby making a finished concrete thoroughly uniform.

For further information the reader is directed to write R. Z. Snell, South Bend, Ind.

Harmon S. Palmer's Patents Established by Nine Recent U. S. Court Decisions

Showing Machine Open With Two Blocks Made at Once Ready for Removal

Ours has been an expensive and trying struggle to maintain our rights

We Own the Basic Patents of the Hollow Concrete Block and Block Machines Numbering 159 Claims

Ours the Only Machines Free From Infringements

The patent laws have shown us that not only the maker, but the **seller** and **user** are liable for infringement. We sell the **Standard** and **New Multiple Automatic.** The automatic machines are either twenty-four or thirty-two inches in length, any width and nine inches high. Will make **two piece blocks, staggered air space, two or more** at **one time** if so ordered. We do not claim our machines are the cheaper **only in the long run.**

OUTPUT! OUTPUT! OUTPUT!

A Combination That is Revolutionary

Multiple Makes any size or number of blocks within its capacity. **Automatic** One operation opens the machine and removes all cores, dividing plates, etc. A reverse movement again closes the machine and locks it completely.

GREATEST SPEED—LEAST LABOR—WRITE FOR PROOF.

The original inventor's latest production in Hollow Concrete Building Block Machines; advancing the industry one hundred per cent

Harmon S. Palmer's Self-Closing-Automatic-Adjustable

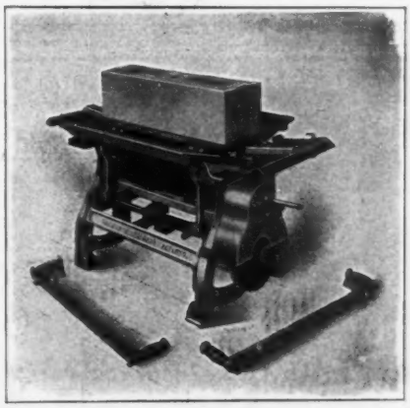
The crystallization of every merit in the industry to date. Blocks of every size, length, angle, height and contour produced with astonishing ease and rapidity.

Two Highest Awards at St. Louis Exposition. Adopted by the U. S. Government and Panama Canal Commissioners

WANTED
Live Agents, Good Factories and Local Lawyers

We agree to prosecute infringers. Many already enjoined. Many suits pending.

Write for Catalogue "A" **WASHINGTON, D. C.**



STANDARD

Smooth, tough "leads" are the result of skilful and careful grinding, working and firing. It is this care and skill that make Dixon's Carpenter Pencils standard. Send 16c for generous sample lot 183 J.

JOSEPH DIXON CRUCIBLE CO.,
JERSEY CITY, N. J.

UNION METAL CORNER BEADS ARE DOUBLE HOT GALVANIZED

Union Metal Corner Bead No. 2.

A Steel Corner Bead to be efficientmust be anti-rust.

UNION METAL CORNER BEADS are double hot galvanized after all perfororating and forming has been done. This insures the greatest possible protection against rust.

NO OTHER CORNER BEAD MANUFACTURER offers a metal corner bead protected from rust in this manner.

Aside from its many other good points this anti-rust feature alone is sufficient reason why it will be to your advantage to use UNION METAL CORNER BEADS.

Write for circulars, prices, estimates, etc.

UNION BUILDING MATERIAL CO.,
407 Chamber of Commerce Bldg., CHICAGO, ILL., Phone Main 2714.
BRANCH: 1170 Broadway, New York.

FOLEY MFG. CO. CHICAGO

MAKERS OF **MILL WORK** OF ALL KINDS

SASH, DOORS, FRAMES
PLAIN AND EMBOSSED MOULDINGS
FINE INTERIOR FINISH

Send your Lists and Plans for Estimates

THE FOLEY MATERIALS THE **BEST**

For Commercial Greenhouses and Private Conservatories

Plans and Estimates on request. Illustrated Catalogue.

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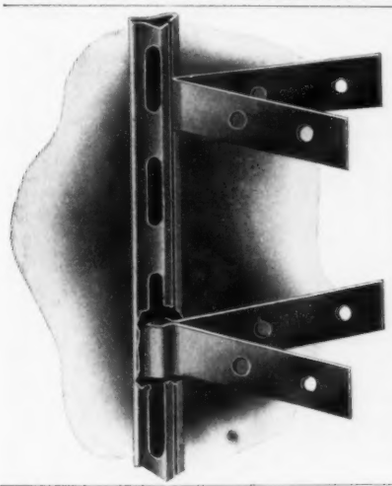
Secures perfect ventilation in Greenhouses, Stores, Shops and Factories. Send for descriptive pamphlet

FOLEY MFG. CO. 471 W. 22nd St. CHICAGO



UNIVERSAL STEEL CORNER BEAD

For the Protection of All Plastered Corners and Angles

¶ The Best, the Easiest to Erect and the ONLY PRACTICAL CORNER BEAD. ¶ Specified and used by the most exacting Architects, Contractors and Builders. ¶ LET US PROVE IT. ¶ SEND FOR SAMPLE AND PRICE.

MANUFACTURED BY

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When you want any STRUCTURAL WORK it will pay you to write to the

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ESTABLISHED 1872

CONVERTORS OF

IRON and STEEL into BOLTS, EXPANSION BOLTS, NUTS, and all kind of STRUCTURAL WORK for MILLS, CHURCHES, HALLS, FACTORIES, BRIDGES, WHARVES, ETC., AND IRON WORK of all kinds forged and made to order.

DEALERS IN HEAVY HARDWARE and CONTRACTORS' SUPPLIES

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USED WITH ANY STOCK SCREW

Write for Samples and Prices

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147 CEDAR ST. NEW YORK, N. Y.

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NOTICE TO ADVERTISERS.

New copy, changes and corrections for advertisements must reach office of American Carpenter and Builder, 196 Fifth Ave., Chicago, not later than October 20 in order to insure insertion in the November number.

Special Notice

—TO—

Contractors and Builders

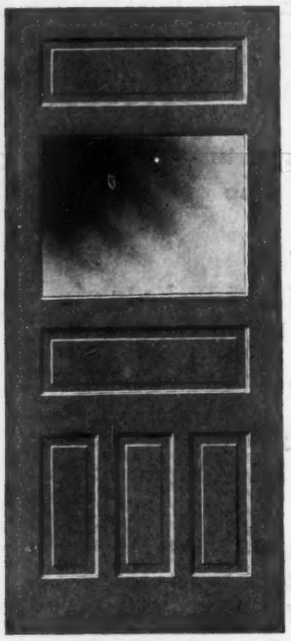
IT IS well worth while, for you and for us, to set forth a plain statement of facts about Millwork. If you have any use for Doors, Windows, Moulding, Porch Work, etc., it will pay you to read on.

We don't want to brag, but we are absolutely the only firm in the United States taking the lumber from our own trees and delivering it, in its finished form, to the consumer. We own our timber lands. We saw our logs. We manufacture our own Millwork. In short it's "From Tree to You."

If you could save, say 25 per cent to 50 per cent, and get the highest grade of goods, wouldn't you be a dodger not to do it? Well, we can save you that much and more.

Isn't it a fact that your greatest trial is DELAY. We can and will save you this trouble. We ship all our goods in stock in 48 hours.

Storm Sash and Storm Doors



STORM DOOR
Glazed Clear Glass, Painted

$1.72

70 SIZES ALWAYS IN STOCK

Storm Sash as Low as 64 Cents

DOORS

Modern Front Doors as low as $1.55 each. Interior Doors furnished in White Pine, Yellow Pine, Cypress and Yellow Pine Panels; you can buy a good door at 74 cents.

WINDOWS

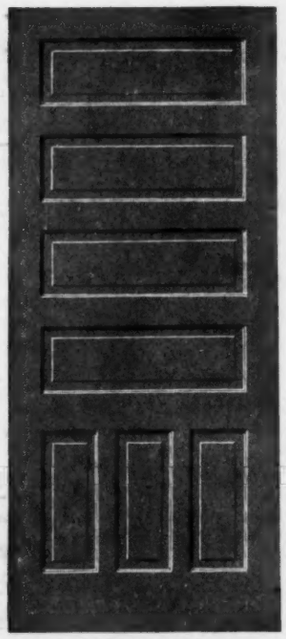
Glazed, Best American Glass, as low as 50 cents.

MOULDINGS

Everything you need in White Pine, Yellow Pine and Cypress.

Porch Work, Stairs, Glass and everything you need in construction of your house.

EVERYTHING IN MILLWORK



STORM DOOR
Painted

$1.19

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